COAL AGE

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Cultivating Public Opinion

Coal mining is a business in which the public rightfully has an unusual interest. The ordinary citizen is keenly interested in the methods of mining and selling coal. He realizes that the supply is limited and cannot be re-created like the products of the soil. He also knows that he must buy fuel to secure warmth and produce power, and that the price he must pay for this necessity is proportionate to the operating efficiency that prevails.

THERE is an old saying, "Once in every 10 years every man needs his neighbor." The neighbor of the coal owner or colliery official is the everyday citizen whose dreams and ideas constitute public opinion. Mining men have found that they need the good-will of public opinion, not once in every 10 years, but every hour of every day.

There may be a few people who believe that public opinion is the poor judgment of the many who are incapable, as opposed to that of the discerning few. However, all the "live ones" today recognize that the good-will of employees and patrons is an asset of great value, and that such opinion must be reckoned with in the final disposition of all important questions.

When a mine official wants to purchase a new mining machine, he goes straight to the advertising columns of his favorite journal and proceeds to get in touch with the fellow whose goods look best to him. Let's apply the same tactics to the matter of giving the public the facts about business. There are lots of things our particular public are interested in, and when these things are properly presented, the ordinary citizen will step in and see that criticisms of methods and policies are at least just.

There's the question of commissaries. Merchants in near-by towns have been telling the public that they can't make a living because coal-mine employees are compelled to trade at company stores. As a matter of fact, many coal companies do not run their commissaries for profit, and it's not fair to such corporations to allow the public to believe the story of the merchants downtown.

One progressive manager recently met this condition by giving to the public his figures for a year, which showed that barely 12 per cent. of the gross payroll of his operations was absorbed in commissary sales. Give out your own figures—they may surprise you as well as the public. Commissaries in most cases are not the ogres they are reputed to be.

Mining companies are doing a lot of welfare work and spending considerable money on safety and sanitary measures. The public may know something of this, but the chances are that they don't know that when times were out of joint and the mine was idle for several months, your welfare committee looked up employees who were needy and took care of them until conditions had improved.

The average citizen is not a bad fellow at heart, but he forms many opinions from what others tell him. He would be glad to know how little it costs your men to rent good houses, secure first-class medical service and all that sort of thing. Such publicity would do a lot of good and might inaugurate a new era, based on a better general understanding of corporate matters in your community and district.

Accidents from Carelessness

[This is the fourth installment of articles describing actual instances where the results of carelessness have been serious and in many cases fatal. The accidents described in these articles are common to all coal districts and to most mines, but it is the everyday occurrences that are soonest forgotten. This campaign for safer mining is based on the idea that knowledge of the mistakes made by others is the best way to prevent similar disasters in our own lives.—Editor.]

Loses Hands and Sight

By J. W. Powell*

I recall a pitiful accident which occurred at a mine where I was manager 10 years ago. The person injured was a man whom I respected highly as he had been in the employ of the company for years being engaged in the capacity of fireboss. I always found him to be a trustworthy and careful official, but he became dissatisfied with his position on account of the miner's making much higher wages than himself without sharing any of the responsibility.

Firebosses here were paid $105 per month while miners made $5 or $6 per day and even higher. After hearing several of his requests, I made up my mind that it was not good policy to keep a dissatisfied official on the staff and granted him his wish to mine coal.

In a short time, I was notified that an accident had occurred at his working place and rushed with all haste to the scene. What I beheld is pitiful to describe. Both his hands were blown off completely at the wrists and both eyes were rendered sightless.

While engaged in making up a shot (with his naked light on his head) a spark from his lamp dropped into a box of blasting caps which was practically full with the above results. (*In a hurry he had taken a chance.*)

This same practice I am confident is being followed by scores of miners throughout our country every day. I wish they could have seen this unfortunate person who for the balance of his days plodded through life sightless and helpless through taking a chance.

Miner Was Choked to Death

By S. C. Dickinson†

Safety first, the slogan of many mining companies, is coming to the front more and more every day, and in the course of a few years it will eventually be the slogan of everyone. First aid forms a very important part of the safety movement, and unless everyone employed in and around the mines takes advantage of this great preservative of human life, through free instruction from the United States Bureau of Mines or in some other way, safety first will not progress as it ought.

In some coal mines using 500 volts d.c. it is necessary for the men to push their cars from the parting to the face, and in many instances they have to pass under the trolley wire in so doing. In one such mine, two men left the face to get a car from the parting, and one of them while at the bottom of the room came in contact with the wire and was knocked unconscious.

The treatment for this, as everyone ought to know, is artificial respiration supplemented by treatment for shock. The latter consists in giving stimulants internally and externally.

At the upper end of the windpipe is the larynx, part of which we know as the prominent Adam's apple in the throat. As the larynx is in front and the gullet is behind, food and water passing to the latter must pass over the upper end of the larynx and would enter it if some protection were not provided. This is afforded by the epiglottis, a muscular flap, or curtain, which falls into position covering the upper end of the larynx so that ordinarily food does not enter it.

In an unconscious person the epiglottis fails to work, and any attempt to give a person in this state food or water will result in choking him. Under no circumstances should an unconscious person be given anything to drink.

The miner's buddy, in this instance, not knowing what to do, forced water into his partner's mouth and of course it naturally ran into his lungs, choking the victim.

Mr. Miner, why risk the lives of others by not availing yourself of the teachings of first aid to the injured?

The men who knew what treatment to give in this case worked on the patient for 2 hr. and 35 min. (using the Sylvester method), but owing to the fact that the miner had been choked to death before they arrived, it was impossible to restore respiration.

The Hoisting Rope Broke

By Gaston Libiez*

On June 1, 1900, at 3 p.m., an accident that might have turned into a serious disaster occurred at the No. 6 mine of the Noeux & Vicoigne Coal Co. in France. The rope broke and the cage went down with 14 men on it (myself included) stopping 120 ft. above the sump. Nobody was hurt, but the story is instructive.

There are three levels at the following depths: First, 221 m.; second, 245 m.; and third, 303 m. The cage was loaded on the second level and was equipped with safety catches. It was of double-deck construction with a capacity of four cars. The cars were of steel, and each held ¾ ton. When lowering and raising men, the catches were unlocked and no loaded cars were permitted on the cage. The cage capacity was eight men to each deck. The sides of the cage were closed with sheet iron.

When most of the miners were out, the cagemen used to lock the catches again and send up trips of coal until there were 20 or 30 men ready to come up. It so happened on this particular day that there were 14 of us waiting, so that we were two men short of two deck loads. The cageman, however, decided to send us to the top, and putting two loaded cars on the lower deck, he crowded 14 of us onto the upper deck, which, of course, was six more men than it was customary to haul on one deck at a time.

We asked him to unlock the catches. He replied: "Go ahead; the top men will not have to trouble to lock them." However, some of the boys put down the locks

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†Special agent, Government Exhibit Board, San Diego, Calif.

*Peru, Ind.

just in time before the engine started to hoist us up. When the cage reached the first level, the hemp rope broke close to the sheaves and all went down rapidly. The catches did good work, stopping the cage about 50 ft. below the second level. The buntons broke, but the cage hung suspended. The rope fell by the side of the cage, landing in the sump. Ten minutes later, being unhurt, we were all climbing the ladders to the top.

The experience, however, was horrible and I would not like to repeat it. The cageman's son was on the cage with us, and only the goodness of Providence prevented this boy being killed through his father's carelessness.

His Impatience Caused the Death of His Stepson

By F. G. Selbe*

A young man who was braking on a gathering motor met death through a careless move on the part of his stepfather. He was a machine-runner. The accident occurred at about 11:45 a.m. when the machinemen had finished cutting room No. 44 and were preparing to move the machine to the adjoining room, No. 45.

A loaded car was standing in room 45, making it necessary to move the car of coal before the machine could enter. The machinemen assumed that the motormen were eating their lunch, so they decided to drop the car by hand out onto the main entry. On descending the grade they found the brake to be ineffective, and the car dashed down upon the main haulway.

The motormen who were supposed to be eating lunch were just passing on their way to get a trip of loads before they started their noonday meal. As a result the car collided with the locomotive, catching the stepson, who was riding on it, and crushing his hips so seriously that death resulted soon after his arrival at the hospital.

Moral: Men working in mines should always be governed by the rules and regulations of their employers. If this stepfather had not been selfish and had been willing to wait 20 or 30 min. for the motormen to come around, the accident would not have happened.

Willful Misconduct

By William Jardine†

Willful misconduct is often the cause of accidents—some slight and some fatal. Frequently you hear of men and boys who, while working around machinery, get hurt, and if you ask them to tell you how it happened, very often they say, "I have done the same thing before and I did not think I was doing wrong." It is just the same in the mines.

I know a man who, when his place was fenced off on account of gas, used to go into his place and light it. When being censured about this, he would say, "Oh, I know all about gas. You can't tell me anything about it." He lighted the gas once too often. One morning there was gas in his place. He set fire to it, but there was more than he had anticipated. His son was fatally burned, and the miner himself lost five months on account of his injury.

I recall another accident, in which two men were killed and one seriously injured, the latter losing a whole year's work. The mine managers came on top for breakfast, and in the office they would meet the hoisting engineer; all of them then would breakfast together and talk over the general business of the colliery.

At these mines the managers take all of the gelatin and detonators into the mines. They have to go to the magazine and fill the boxes with gelatin for that purpose. One morning, while pursuing their usual duties, they found an old electric globe. Picking it up and examining it thoroughly, they observed a little difference in shape from the ones that were used in the office. They made their way back to the office, laid the gelatin and caps on the floor, underneath the electric lamp.

Curiosity then got the best of them, and one ventured to test the queer bulb to see if it was a good one. He unscrewed the lamp in use and inserted the odd-shaped globe in its place. The globe burst, causing the caps and gelatin to explode. The hoisting engineer and one mine manager were killed. The other manager was seriously burned, and the mine office was wrecked.

Brushed Away Grains of Powder with a Lighted Lamp

By F. A. Behymer*

It is desirable that loose grains of powder be brushed away, but a flaming lamp is a poor thing to do it with. Ludwig Janks brushed away some grains of powder in the Carbon Coal Co.'s Lasalle, Ill., mine one day, and the result was that parents mourned and a widow wept and would not be consoled. Also four children were made fatherless.

On the morning of that day, Janks had neglected to provide himself with enough powder for the day's demands. Before the shift was done his powder was gone. But he knew that in other rooms were miners who were more provident in matters that pertained to their tasks, and he did not doubt that he would be able to borrow from one of these the powder needed to complete his work.

Alexander Mikatewicz, who was at work in the adjoining room, was 48 years old; there was a wife and four at home, and he took no risk of running out of powder before his day's work was done because he had need of the day's wage. In a place that he reckoned was safe, he had two kegs of powder.

Janks went to his neighbor, Mikatewicz, to borrow, and Mikatewicz was willing to lend to his neighbor Janks. They went to where the kegs were, and Janks, stooping over them, noticed that on one there were scattered grains of the powder. It seemed to him a careless thing for grains of powder to be scattered about. Other miners not far away heard him say something about it.

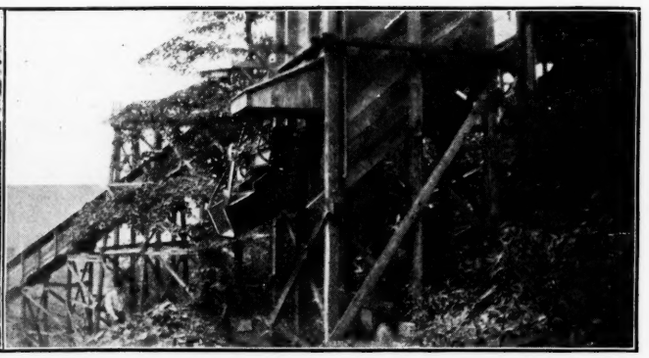
He lowered his lighted lamp to brush them away with the flame. Mikatewicz cried out an affrighted warning. The scattered grains spat tiny sparks, and then there was a flash and a roar as the kegs exploded. The two men were killed instantly, and there wasn't enough left of either to justify the belief they were once happy human mortals. No amount of experience and persuasion will convince some people that powder is really dangerous.

*Mine foreman, Cannelton, W. Va.

†Mine manager, No. 4 mine, Bunsen Coal Co., Universal, Ind.

*St. Louis, Mo.

LOWER END OF COAL CHUTE



SLATE BIN WITH ELECTRIC GATE

A Plant for Thin-Seam Coal

By R. G. Read*

SYNOPSIS—The thin coal bed lying above the Georges Creek Big Vein was long considered of little value. As this coal is an excellent steam and smithing fuel, as well as because the thicker measure is being rapidly worked out, the plant here described was designed to develop this bed on a large scale.

The Maryland Coal Co. has been for many years one of the leading producers of Georges Creek big-vein coal and has recently started operating on a comparatively large scale in the small vein lying above the main Georges Creek seam.

This coal, known locally as the Tyson seam, is of an exceptionally high grade for steam and smithing purposes and is considered by many authorities to surpass the big vein in quality for these uses. The thickness of the seam is about 36 in., and the coal is entirely free from slate or other physical impurities.

For many years this seam was considered of little or no value, owing to its small thickness and to the physical obstacles to its development. Of course, its proximity to the big vein, which combines all the advantages of thickness and favorable mining conditions, was partly responsible for this belief. Many unsuccessful efforts were made to develop it, but these failures were due primarily to the use of the same mining methods as for the big vein.

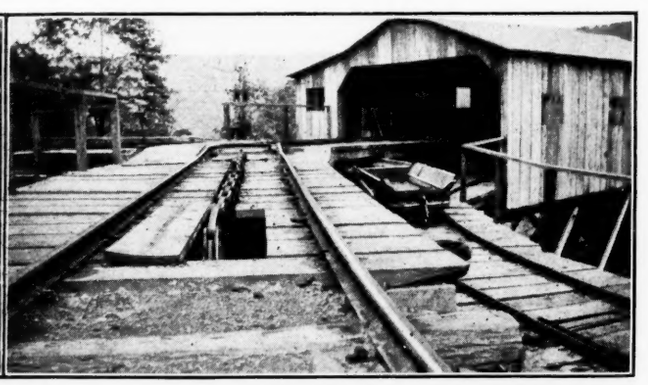
*Fisher Building, Chicago, Ill.

The seam is very irregular, consisting of a series of local rises and dips, so that it is hard to make any definite projection for development. The fundamental consideration in the plans for this operation has been the elimination of all manual labor in handling the coal after the actual mining operation is completed. On account of the exhaustion of the big vein in this region there is a plentiful supply of the highest grade of American or English-speaking pick miners, who can be drawn on for this service, so that it was not considered advisable to employ machine mining.

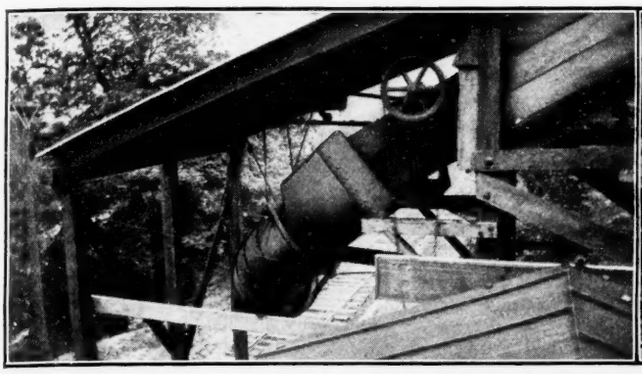
The power for all purposes is furnished by the central power station at Cumberland, the transmission being a 23,000-volt three-phase circuit. The substation equipment consists of Westinghouse transformers lowering the potential to 2,300 volts and a motor-generator set delivering 250-volt direct current. Because of the heavy fluctuation in load and initial voltage, the use of a rotary converter was not considered advisable in this particular installation. Actual tests have proved that the motor-generator set gives a higher average efficiency than the manufacturers would guarantee for the rotary unit.

A 10-ton Jeffrey locomotive is used for haulage, but it is intended to replace this with 6-ton locomotives, as the larger machine is not flexible enough for the requirements. Owing to the adverse grades in the rooms because of local dips, room hoists are employed when desirable. These hoists are so rigged as to be easily moved from place to place and from section to section, as required.

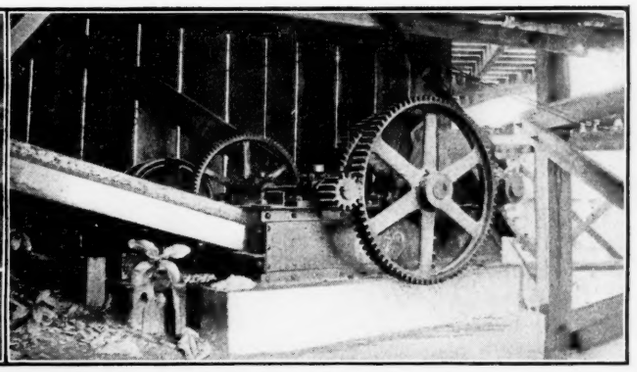
SIDE VIEW OF HEAD HOUSE



CAR HAUL AND HEAD-HOUSE ENTRANCE

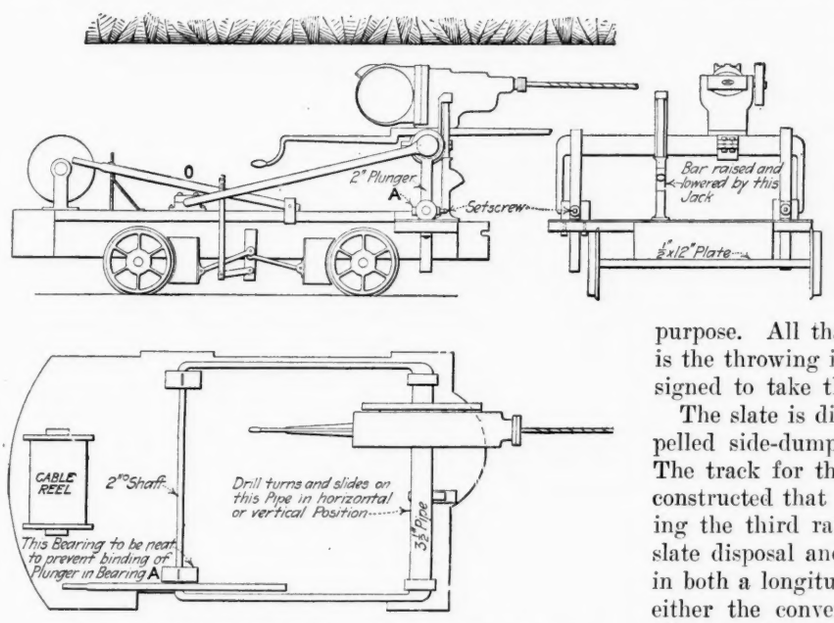


THE SPIRAL COAL-LOADING CHUTE



THE CAR-HAUL DRIVE

The tipple is of simple design, as no preparation is required and breakage is of no consideration. The haulage locomotive delivers the trip to a feeding car haul, which feeds the cars to a cross-over dump after passing over the track scales. This car haul is equipped with push-button


2" Plunger
A
Setscrew
Bar raised and lowered by this Jack
1"x12" Plate
CABLE REEL
2" Shaft
Drill turns and slides on this Pipe in horizontal or vertical Position
3½" Pipe
This Bearing to be neat to prevent binding of Plunger in Bearing A

THE ELECTRIC DRILL MOUNTED ON ITS TRUCK

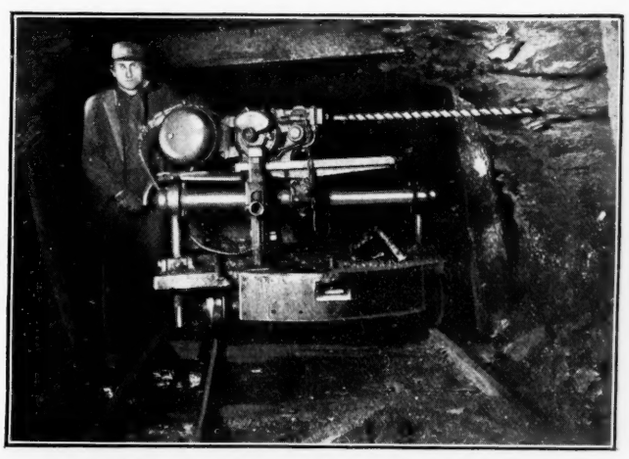
control and magnetic accelerating switch, together with a field control for adjusting the speed from three to five cars per minute. An automatic device opens the car doors, so that the dumping is accomplished with a minimum of labor.

The coal is dumped into a chute approximately 200 ft. long. The end of this chute is provided with an undercut gate and a spiral-pipe loading chute. The structure is of wood, as are all the buildings, for the limited life of the operation does not justify a more expensive type of construction.

Since the headroom in the mine is small, it is necessary to take down about 18 in. of slate and rock. Careful attention was given to the handling of this material, as it was realized that the success or failure of the operation would depend on economy and efficiency in its removal and disposal. The first step was to secure a suitable electric drill for the purpose. After a careful investigation of all makes on the market the Fort Wayne drill was adopted. It was soon apparent, however, that a suitable mounting for this drill must be provided, as the usual tripod or post mountings are not easily portable and are not flexible enough for the service. The truck mounting shown in the accompanying illustrations was designed and perfected for the work. Patents are now pending for this device, and it is being put on the market. The slate is loaded into mine cars and hauled in regular trips, provision being made for taking the cars to the slate dump after passing over the car haul and before reaching the scales in the tipple. The slate is dumped into a 50-ton bin. Owing to the fact that no steam is used, it was necessary to design an electrically-operated gate for this bin, as no hand-operated gate on the market is large enough for this purpose. All that is necessary to open or close the gate is the throwing in of a knife switch, the motor being designed to take the line voltage for starting.

The slate is discharged into a 4-cu.yd. electrically propelled side-dump car arranged for third-rail operation. The track for this car runs along the hillside and is so constructed that it can easily be shifted laterally, including the third rail. This permits of great flexibility in slate disposal and allows the refuse heap to be extended in both a longitudinal and a transverse direction to meet either the convenience or the necessities of rapid and efficient refuse disposal.

The entire operation was planned and developed by Superintendent Elkins Read, the mechanical equipment being furnished by the writer.



THE ELECTRIC DRILL IN OPERATION

Under Officials' Relation to Accidents in Mines

In Great Britain there are several associations of colliery firemen, examiners or deputies, and they are all banded together in one federation with a membership of 12,000 to 13,000. Among the objects of the associations, education figures largely, and at the January meeting of the Lancashire body both the chairman and the lecturer were general managers of colliery companies. The latter, W. H. Johnston, of the Bamfurlong collieries, had for his subject accidents in mines, discussing the relations of firemen (firebosses) thereto.

As a first essential in cutting down the number of accidents he recommended the enforcing of the strictest discipline, the prevention of accidents being more in the hands of the fireboss than in those of any other official. He made no secret about the fact that good, intelligent firebosses who had their wits about them and who were really interested in their work were an absolutely invaluable asset to a colliery.

Mr. Johnston quoted statistics showing that more men are killed by falls of roof and side than by all the other classes of accident underground added together and that many of them could be prevented by a little more care or forethought. This is where the fireboss may be a factor for good or evil, for if the ordinary workman sees that the fireboss is not exercising the utmost vigilance he is not likely to be very particular himself. Mr. Johnston does not believe in always nagging or bullying the men, for that is not the way to get work done; but the first duty of the official is to look after the safety of the workers, and lack of discipline spells lack of safety.

Dangers of Drawing Timber

Reference was made to the dangers associated with timber drawing, accentuated often by the recklessness of the men themselves. A man about to draw timber should see that he is provided with a gablock and chain and should carefully examine the roof roundabout the prop he is going to draw. He should then specially set a prop to which to attach the prop drawer. A prop should not be used as an anchor which has been set to support the roof, for the prop may have been strained by the roof pressure and so may come out by the action of the drawing machine, in which case the man who is using the machine will quite likely get hurt by the roof falling on him. In choosing the position for the anchor prop, the drawer should carefully examine the roof to see that he is under a perfectly sound, well-timbered top and that he has left himself a good road for retreat in case a larger fall takes place than he expects when he draws the prop. He should also see that there are some good sound props between him and the prop he is going to draw. He may then, but only then, said Mr. Johnston, proceed to draw the prop with reasonable safety. Having drawn the prop he should remove it by pulling on his chain or by using a long pole with a hook at the end. By these means he does not need to expose himself beneath the roof from which he has just drawn the support.

As regards falls of roof on the road, many of these accidents can be avoided by a little foresight in setting the timber. If the sides of the road are of good solid ground, the bars can be carried on short props, set off a ledge on the side of the road, or the bars may be notched into the sides without any props at all being set. Should the sides not be good enough for this, Mr. Johnston has sometimes found it beneficial to build a stone wall between the props a little bit thicker than the diameter of the prop. By this means if a car does get off the rails it cannot catch the props.

Numerous accidents occur while men are engaged in cleaning up falls, owing to further falls occcurring. The first thing to be done, Mr. Johnston said, before tackling a fall is to secure the timber that is left standing to prevent its being knocked out should a second fall take place. As a rule the best way to begin is to middle-leg the first three or four bars on each side of the fall to prevent the fall from spreading. Then set "lines" close up against the bars next to the fall. There will now be something solid to timber from, because it is no use timbering off bars that are not themselves secure. When this has been done, each fall of course, as the lecturer remarked, presents its own peculiar problem, but as a general rule it is as well to get the "stretcher" set off the last good bar and get them covered over, so that the men who are handling the débris have some protection over them.

The surest way to deal with accidents caused by gas or dust is to strike at the root of the evil. Gas cannot be prevented from being given off from the coal nor can dust be prevented from being made during the getting and the subsequent handling of the coal, but to a large extent gas and dust can be prevented from accumulating in dangerous quantities. Mr. Johnston's view is that it is not the large accumulations of gas which are the most dangerous, because as a rule they are well watched. It is the comparatively small accumulations that are overlooked which constitute the gravest danger. The watching for and clearing away of these lies with the fireboss.

It is essential that the fireboss should make absolutely true reports of the conditions and the places he examines, however bad they may be, for then the manager has a chance of rectifying the evil. Should the evil be glossed over in the report and it happens that the manager visits that district while the evil is still in existence, his faith in the responsible fireboss will be absolutely destroyed and he will trust him no more.

The Question of Shotfiring

Regarding the question of shotfiring, if there is a cavity in the roof anywhere contiguous to a shot hole and the shotfirer can examine it, well and good; but if it is inaccessible, Mr. Johnston considers this the very best of reasons for not firing the shot. If it cannot be proved that the gas is not there, always assume that it may not be inaccessible to the flame of a blown-out shot.

In reference to accidents arising from explosions of coal dust firebosses would do well to study the official reports on experiments conducted in America, France and Great Britain. So far as they themselves are concerned, the best service they can do is to prevent the dust from accumulating at all by keeping the bars and sides and roof and floor of the haulage roads in their districts well swept up. Firebosses are apt to become careless when handling explosives—a case of familiarity breeding contempt. They should avoid blown-out shots, and the stemming should be pure clay. The risk of firing with a short cable in a tunnel and having to take cover in a car should not be taken. Many accidents are the result

of bad discipline—boys and others, but especially boys, doing things they ought not to do and leaving undone things which they should do.

Mr. Johnston referred to the early days when the fire-boss had to burn or explode any gas he found, going into the workings armed with a long stick. When he came to a place likely to contain gas he stuck his candle on the end of his stick and pushed it up into the cavity. If there happened to be only a little gas, it went off "pop," and no harm was done; if there was a lot of gas, he went off "pop," and did not return to report it.

Meeting of the Rocky Mountain Coal Mining Institute

The meeting of the Rocky Mountain Coal Mining Institute will be held on June 14, 15 and 16, at Salt Lake City, Utah. A special train will leave Denver, Colo., via the Denver & Rio Grande, Monday, June 12, about 8:30 a.m., stopping two hours at Glenwood Springs and arriving at Hiawatha Tuesday morning, when the following objects of interest will be visited: A $160,000 steel tipple with 5,000 tons daily capacity; a 12,000-ft. gravity plane; a 2,800-ft. aërial tram with 1,000 tons' capacity; a circular steel and concrete tipple, and an operation on a 28-ft. seam.

The train will reach Salt Lake City Wednesday morning, June 14, where two days will be spent in the business of the Institute, a visit to Saltair, to the great organ in the Mormon Tabernacle and to numerous points of interest in and about the city. The meeting will end with a banquet. The following papers will be read at the meeting: "An Address to Young Men," by John McNeil; "Safety First," by J. E. Pettit; and "Some Notes on Explosives," by F. W. Whiteside, secretary-treasurer of the Institute. President A. C. Watts predicts that this will be the best-attended and most interesting convention the institute has so far held.

Problem of Efficient Power

In his lectures before the Royal Institution of Britain Prof. W. A. Bone dealt with the power problem, the solution of which he says involves several separate considerations. Among these are the question of the relative thermal efficiencies of the different systems of converting the energy of coal into available power, also the general planning and organization of a power scheme in regard to capital outlay, operating costs and other matters such as simplicity and reliability. This last consideration requires a careful review of local conditions which are sometimes so important that they govern in large degree the choice of equipment.

The question of the ultimate net cost of the power, including cost of fuel, labor, supervision, interest redemption and depreciation, must always be the main and overruling considerations in any given case, and it by no means follows that the most efficient system from a purely thermal point of view will under any given conditions be the cheapest in the long run.

The professor mentioned that from the viewpoint of size of units the turbine has shot ahead; the big Parsons turbo-alternator recently installed at Chicago is of 35,000 hp. capacity, far surpassing anything yet attempted with an internal-combustion engine unit.

To achieve all economies made possible by modern engineering, he says two things must be brought about: (1) The owners of existing inefficient plants must, supposing their requirements are large enough to justify their using a separate generating plant, be prepared to put the old plants on the scrap heap without remorse and substitute really efficient equipment. (2) In order to meet the necessities of innumerable relatively small consumers, the whole question of the organization of public power schemes for the generation and distribution of electrical energy in the most efficient manner and at the lowest possible cost should be considered.

Engineers' Operating Data File

By Charles H. Bromley

SYNOPSIS—A 14x5x4-in. filing drawer serves as a receptacle for cards bearing important data about the plant, its machinery and supplies. Typical cards from the drawer are shown.

With little more time than it takes to swing around in your swivel chair, could you tell the names and sizes of the attachments on your boilers; or the sizes of certain important pipe lines; or what it cost to reblade the 500-kw. turbine, rebladed two years ago; or just what the figures were on that special high-priced oil test; or how the power-house expenses for 1914 compare with those for 1915? One of the best—and by that I mean one of the quickest, simplest and most convenient—methods of recording these and many other valuable data that I have so far seen is the "operating-data" drawer in the office of a Boston engineer. The drawer in this plant is one of many in a common cabinet; but for most plants the dollar-and-something kind—one drawer, 14x5x4 in., in a wooden or steel casing by itself—fills the requirements. Filling the card is the work of but a few minutes, for things worth filing you have made note of at some time or other.

The more one gets around and the more plants one sees the more convinced he is that the chief—in most instances the sole—reason that so many engineers have no record of plant performances, cost or other data is because they never got started keeping any. Personal inertia, one might say. But once you get started, once you have overcome that inertia, you seem to get momentum enough to carry you on always. I cannot recall one engineer who ever got out of the habit of keeping plant data once he acquired it.

Just inquire into the value of such a file as the one shown. If you have not already, you will some time become convinced that it is not the best practice to make a gasket for an important joint by hammering it out on the flange on which you are going to use it. Would it not be better to get measurements of the flange, place them on file and cut gaskets during a lull? Suppose you have tested and tried a number of oils for a particular purpose and eventually found one most suitable, price considered. Assume further that you are later of-

Gaskets — Barometric Condensers

Large Flange on 30 in Elbow
44⅞ in. Dia. O.S.
37⅞ " I.S.
42 " Bolt Circle
32 - 1¼ Bolts, 4½ " c - c

Large Flange; Top of Cone
60⅝ Dia O.S.
53⅝ " I.S.
58¼ Bolt Circle
48 1" holes spaced 3¾ in c - c

Equipment Repairs
1910 - 1911 against 1911 - 1912

	Increase	Decrease
Boilers		
Boiler Settings		
Pumps		
Compression Machinery		
Absorption "		
Ammonia Condensers		
Brine Coolers		
Steam Condensers		
Piping		
Painting and Inspection		
Repairs, Machinery		
Repairs Misc.		
Engines and Generators		

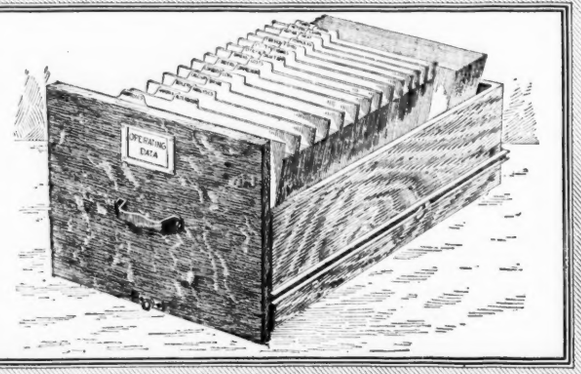
Pumping Engines, S.W. A H

	Gals.
No. 2. 11½ in. plunger, total displacement - rod	52.12
Deducting 5% for slippage, net output =	49.51
" 3% " " " " =	50.55
" 2½% " " " " =	50.81
13½ in. plunger, total displacement - rod	71.48
Deducting 5% for slippage, net output =	67.90
3% " " " " =	69.33
2½% " " " " =	69.69

Basis for figuring, 50.8 gal. for small one and 69.7 gal. for large one.

Analysis Coal 6/26/14

Name	Vol.	Moisture	Fix. Car.	Ash	Sul.	B.t.u.
Slab Fork	14.5	—	78.96	5.92	0.62	15,880



QUINCY MARKET COLD STORAGE & WAREHOUSE COMPANY

PRICE CARD

Goods, Etc. Turbine Repairs — 500 Kw.
Description Westinghouse Machine Co.

From Re-Blading Turbine No. 5 %

	DATE	LOTS	LIST	DISC'T	NET
	9/30/15	Hours			
John Smith		173	125		$216 25
Expenses					71 25
John Doe		224¼	40		89 70
Expenses					68 89
James Williams		224¼	40		89 70
Expenses					68 51
O. Williams		140½	40		56 20
Expenses					45 85
W.L. Long		127¾	40		51 10
Expenses					38 48
Credit acct. blading material returned		114¾	40		45 90
Less return charge	37.92 / 7.62				41 67
					$883 70

SEE OTHER SIDE

Test - Special High Test Ammonia Oil 4/2/14

Gravity	24
Flash	385 deg. F.
Fire	440 "
Cold	+ 10 — 15° "
Viscosity	668 at 70 deg.
"	440 at 100 "

Power House Expenses
1910 - 1911 against 1911 - 1912

	Increase	Decrease
Coal		
Water		
Ammonia		
Calcium		
Oil		
Waste		
Carting Ashes		
Pay roll and Salaries		
Misc. (Packing, etc.)		
Equipment Repairs		
Repairs, Building		
Total		

STIRLING WATER TUBE BOILER, No. 1

1 Unit, 189 hp.
Heating Surface 1892 sq. ft.
Grate " 40 " "
1 Feed valve and 1 check valve, 2 in. each
1 Faber blow-off valve, 2½ in. Dia.
1 Star Brass Steam gage, 12 in. Dia.
2 " " Safety valves, 3 in. Dia. each
1 Reliance water column
Hoyt improved gage cocks
Eureka crank Handle water gage
Piping, brass

SOME TYPICAL CARDS FROM THE "OPERATING DATA" FILE, QUINCY MARKET COLD STORAGE AND WAREHOUSE CO.'S PLANT, BOSTON, MASS.

fered an oil at a lower price and are given the test data and analysis. Unless your memory is extraordinary or you have a record of the analyses of the oils rejected during the past trials, how are you going to know without trial but what this newly offered oil is just like another you have tried and rejected? It should have been just as much your purpose in making those trials to know what not to get as to determine what was best to buy.

If increased load on the plant made it necessary to operate all boilers at 50 per cent. higher rating this year than last, how much more has it cost to maintain boiler settings this year than last? The management, or a visitor, or the firebrick people you deal with may want to know. How much quicker, how much more satisfied you would feel if you could reach over and pull out of a drawer a card bearing this information instead of bothering the bookkeeping or the auditing department and perhaps waiting a day or a week for the answer. Cards such as those above and below the file drawer shown carry a wealth of information when filled out. Of course if the bills and estimates do not pass through your hands, you are unfortunate. But if you could show the management your operating data file and let the boss see for himself that you were keeping tabs for the benefit of his plant, maybe he would begin to see that by such a system of recording and accounting you must eventually become, if you are not already, the best judge of estimates, materials and methods for the power end of the establishment.

Extracts from a Superintendent's Diary

The train crew that do the switching for our mines have of late got into a habit of making up their train and then marching *en masse* to our commissary, where they indulge in soda-pop, cigars, etc. As the commissary is about a half-mile from the railroad, they always take the precaution to leave one of their number behind to look after things, knowing that the youngsters around mines are not to be trusted.

Jim Slaton, a tophouse employee at No. 5 slope, tried railroading a few years back to the extent of holding down a locomotive fireman's job for three weeks; as he chanced to look down from the tophouse today and observed the crew in the act of abandoning their train, he was suddenly seized with a desire to go down and look the engine over.

When Jim reached the cab, the first thing that came back to him was the recollection that during his entire career as a fireman his life had been made miserable because of the treatment accorded him by his engineer, and that reminded him of the resolve he had made to lose no opportunity to even scores. He also recalled that he had seen his enemy, the engineer, on this very locomotive on several occasions, which set him to thinking that if he could only be sure as to who was in charge of the engine today, his opportunity to square accounts was surely at hand. Finally the desire to get even became so impelling that Jim could not refrain from taking a chance; should luck be against him, the man to suffer would still be an engineer, he reasoned, and all engineers were about of a stripe anyway.

First he turned his attention to the fire and in a few minutes had it all dropped through into the ash pan; he wanted to make sure that the locomotive could not be moved too quickly when the crew returned. Then he pulled open the whistle and fastened it so that it would blow until all the steam was exhausted from the boiler.

Of course, the moment the whistle began to shriek all the train crew rushed out of the commissary and started for their train at breakneck speed. A few moments later the trainmaster of the division, who happened to be on a locomotive that was taking water at a tank on the main line only a few miles away, decided that the switching crew were in distress because of the continued blast and ordered a hurried run to the mine.

He arrived on the scene just in time to see the entire crew rounding the last curve on the road leading from the commissary, and in the same breath he caught sight of Jim letting himself down from the cab on one side, while on the opposite side the astonished flagman, who had been left behind to look after things, was making a desperate effort to get into the cab.

The trainmaster and the members of the crew reached the cab almost simultaneously, which happened to be just at the moment that the whistle stopped blowing. Each man said, "Well!" and then silence seemed to settle down upon the entire company. A moment later the flagman in the cab stuck his head out of the window and also said, "Well!" That was too much for the engineer. "I'll well you!" he roared, as he started for the cab.

Jim decided about that time that he had had enough adventure for one day and retired from the field. Since he was my informant, I do not know just how the adventure was concluded.

The Italian Metallurgical Fuel Requirements

The Associazione degli Industriali Metallurgici Italiani has issued an earnest appeal for a regular supply of fuel for the metallurgical and engineering works, in order to maintain the activity necessary in the interests of national defence. The grades in which the association is particularly interested are: (a) Steam-raising coal, Cardiff and other descriptions; (b) gas-producer fuel for open-hearth furnaces, chiefly Scotch coal, splint, etc.; (c) reheating furnace fuel, usually of the splint class, or New Pelton. The association has issued the following summary showing the normal annual requirements of fuel by the chief works and on which others are dependent:

	Tons
Blast furnaces	800,000 coke
Steel works, iron works and rolling mills:	
Openhearth furnaces	300,000 coal
Reheating furnaces	40,000 coal
Boiler furnaces	510,000 coal
Foundries:	
Melting furnaces	50,000 coke
Boiler furnaces, etc.	50,000 coke
Works producing wire and other finished products	100,000 coke
Brass, copper and lead foundries and smelting works	30,000 coal 50,000 coke
Machine shops	100,000 coal

Anthracite Colliery with 125 Mi. of Underground Track—The Olyphant colliery of the Hudson Coal Co. has 125 mi. of railroad track in the mines. In all of its operations it has as much steel railroad mileage underneath the ground as the Delaware & Hudson R.R. has on its whole system from Scranton to Montreal. The upkeep of this underground track is a great deal more expensive than on the surface, as it is subject to acid water, and the ties rot quickly.

The Meaning of Preparedness

By Dana Burnet

SYNOPSIS—Within the past two years a certain word has attained great prominence in the United States. It has crept into our common speech. It has been hoisted to the masthead of our public oratory. Yet for all that it still remains a word obscure in meaning, vague in its application to practical affairs. It is the word preparedness.

With the exception of the extreme pacifists, most Americans agree today that this country should be prepared. Those who perceive only the immediate sense of the word conclude that preparedness means preparedness for war. But the larger and better view is that it means preparedness for peace. The idea of a national insurance effected through adequate armament is beginning to take hold of us.

But what does preparedness mean? Does it stop with a suitable army and navy? When our defenselessness was first pointed out to us by the prophets, we began to ask for more battleships, more fighting men. We learned that it would take some 750,000 trained soldiers to defend the Atlantic Coast alone; and we knew that our total available forces were not more than 90,000. We read that the German cruiser "Bluecher," sunk in the North Sea because she had not the heels to escape, was a faster ship than any vessel in our navy. We cogitated these things and were depressed in spirit. We lifted up our voices and cried to Congress for a larger army and a more efficient navy.

We Need More Than an Army and Navy

We need them both. We need them immediately. We need them first. But we need other things as well, prosaic, unromantic, everyday vital things without which an army and a navy would be as a sword without steel. We need industrial preparedness.

A military unit is a sensitive human machine. Its efficiency depends upon a proper equipment behind the line. It must be fed, clothed, armed, transported from place to place, provided with medical attention and otherwise kept in fighting trim. The military organization is the cutting edge. The industrial organization is the grindstone that whets the blade.

It is necessary for the country to understand clearly that without industrial preparedness military preparedness is worse than futile. It is utterly useless.

Some month ago Mr. Daniels created the Naval Consulting Board. Shortly afterward a subcommittee of this nonpolitical board was appointed to investigate our national industries with a view to their mobilization in time of war. It was called the Committee on Industrial Preparedness.

The chairman of this committee is Howard E. Coffin, one of the best-known engineers in the country. Associated with Mr. Coffin is W. S. Gifford, who has been made supervising director of the committee's work.

It is not the purpose of this article to go into the details of that work, but rather to present the general problem that confronted the committee at the outset of its career. Mr. Coffin decided that there were three initial steps to be taken in the effort to mobilize industry:

The first step was to discover exactly the quantity and nature of munitions that American industry could produce in time of war.

The second step was to formulate a plan by which that knowledge could be applied in such a way as to put the plants of the country quickly into the service of the Government when needed.

The third step was to form an organization of skilled labor that would not break down in time of war, that would prevent such labor from going to the front when it should remain at its accustomed tasks. The indiscriminate enlistment of skilled labor at the outset of the European War, it is now known, caused a serious demoralization of industry in certain European countries and cost millions in lives and in money.

An Inventory of the Nation's Business

The first step, then, was to make an inventory of the nation's business. To accomplish this, Mr. Coffin and Mr. Gifford enlisted the services of the engineers of America. In every state in the Union a board of five directors was formed, composed of leading engineers. Such a board was also formed in Alaska. Working in connection with these boards at the present time are some 30,000 engineers, who would compose the backbone of industrial organization in time of war, as they do now in time of peace.

Mr. Gifford, who is the chief statistician of the American Telephone and Telegraph Co., and whose services have been offered gratuitously to the committee as a matter of patriotism, was placed in charge of the inventory. He prepared a printed form which was to be sent broadcast to the 30,000 engineers throughout the country.

The second step on Mr. Coffin's program was to formulate a plan whereby the plants of the country could be converted to the Government service at a moment's notice.

The plan suggested by Mr. Coffin's committee is very simple. It provides that the manufacturers shall maintain an annual minimum production, in times of peace, of those munitions to which their respective plants are best suited.

In other words, every plant shall produce every year a definite article of war in small quantity, which shall be paid for by the Government at a price to net the manufacturer a fair profit. The ghost of the "munitions trust" will be laid forever. In this way a peaceful machine will be created which, as Mr. Coffin says, "will require only the opening of the throttle to be set in motion at the outbreak of war."

This plan will also insure the continued employment of skilled labor during the period of conflict. Every workman will know his place and remain in it, which is the third step toward industrial preparedness. The economic condition of the country will be stabilized, and suffering through unemployment reduced to a minimum.

About 90 per cent. of our steel production is dependent upon ore supplies, which could be cut off instantly by war. The authority for this latter statement is Richard H. Edmonds, editor of the *Manufacturers' Record*. Other products are in a like precarious condition.—*New York Evening Sun.*

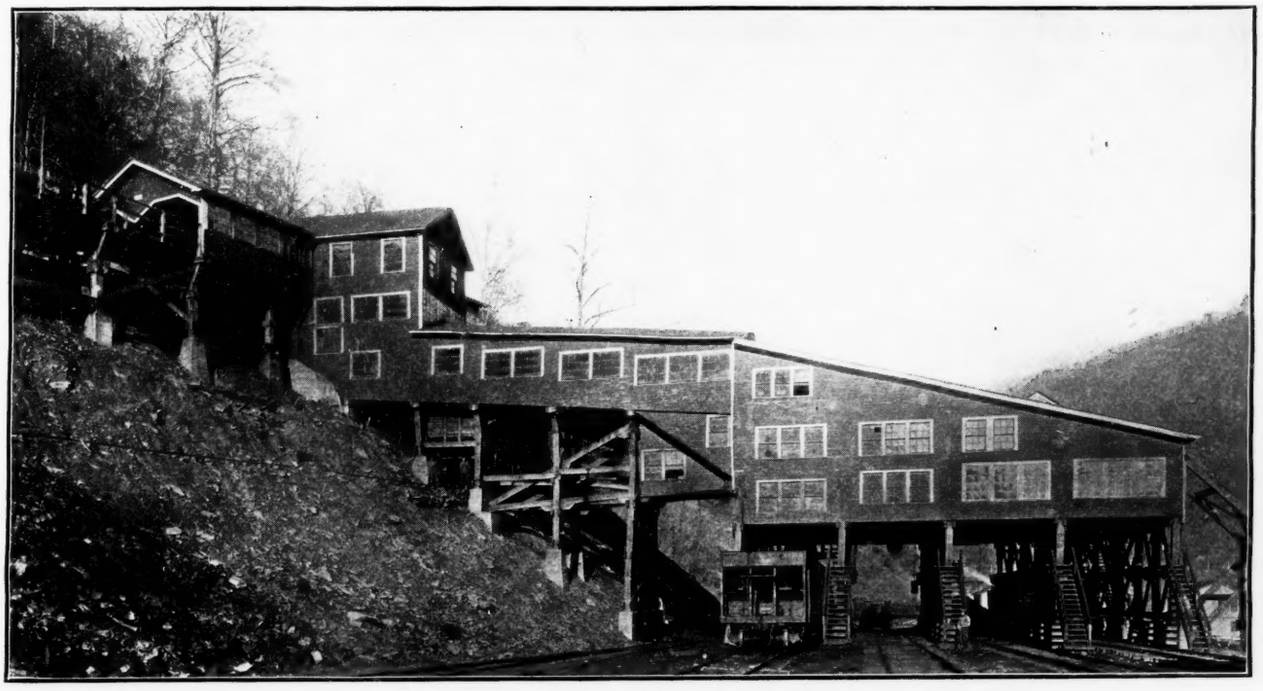
The Tierney Tipple at Stone, Ky.

By H. Reisser*

SYNOPSIS—The tipple, constructed of white oak, is equipped with many refinements not usually found in wooden structures of this kind. Among these are a reciprocating plate feeder and a peculiar type of fixed bar screen, while the lump and egg picking tables terminate in loading booms.

The plant of the Tierney Mining Co. is located in what is known as the Pond Creek region of Kentucky. It lies on the Norfolk & Western R.R. about 12 mi. from Williamson and close to the state line between Kentucky and West Virginia. It was one of the first operations to ship coal from the seam being worked.

The bed of coal now being operated varies from 4 to 5 ft. in thickness. The coal, being fairly hard and possessing a cubical fracture, produces a good size of fuel and one admirably adapted to domestic purposes, the finer grades making a good locomotive fuel.



GENERAL VIEW OF THE TIPPLE AND SCREENING PLANT

The coal bed lies about 60 ft. above the railroad tracks, and the material is brought around the hillside by electric locomotives, in trips of 30 to 40 cars each to the dumphouse. The cars are discharged one at a time by a crossover dump. The coal passes into an 8-ton steel-lined hopper to the bottom of which is attached a reciprocating plate feeder. This is actuated by an adjustable counterbalanced crank. The rapidity of discharge from the feeder may be varied to suit the hourly capacity desired.

The driving head for the feeder is supported on a concrete foundation, while the power is derived from the apron conveyor, being transmitted by a chain drive. From the feeder the coal passes over a bar screen, the purpose of which is to remove fine material, which falls upon the apron conveyor below, thus not only allowing the larger pieces of coal to be deposited on top of the slack, thereby facilitating picking, but forming a cushion for the lumps, thus avoiding breakage.

The bar screen referred to is of peculiar design. Heavy round rods are substituted for the ordinary screen bars. These are bent downward at the lower extremity of the screen, thus preventing clogging. By this means also the screen is more rigid and does not sag like ordinary bar screens.

A Link-Belt corrugated type of apron conveyor 48 in. wide and mounted on a double strand of bushed steel roller chain brings the coal to the screenhouse. This conveyor slants downward and discharges coal into a hinged steel chute. The chute is constructed with a fly gate, so that in an emergency the coal may be loaded on the inside track under the screenhouse, instead of passing over the shaking screen as is ordinarily the case.

A small screw conveyor placed at a point directly under the chute catches and disposes of the small pieces of coal, which tend to cling to the apron as it moves around the head wheel. This fine material is discharged through a chute to the slack hopper under the upper shaking screen.

The screening and picking house spans four loading tracks. It contains the shaking screens, picking tables, loading booms, cross-conveyor, the refuse and mixing conveyor, and various chutes and hoppers.

The shaking screens are 8 ft. wide, hung in tandem by forged adjustable hanger rods. They are constructed entirely of steel plate and angle iron. The upper screen removes the slack and nut coal, discharging them either

*Chicago, Ill.

directly onto the nut and slack tracks or combining and discharging them into the slack hopper.

The lower screen removes the egg coal, depositing it upon the egg picking table, which terminates in a loading boom, discharging the coal into the railroad car without breakage. The lump coal passing over the end of the screen is deposited on the lump picking table, which also terminates in a loading boom.

The cross-conveyor is a corrugated apron 36 in. wide and placed directly under the slack hopper. Its function is to receive all nut and slack coal from the slack hopper and carry it to the top strand of the combination nut, slack and refuse conveyor.

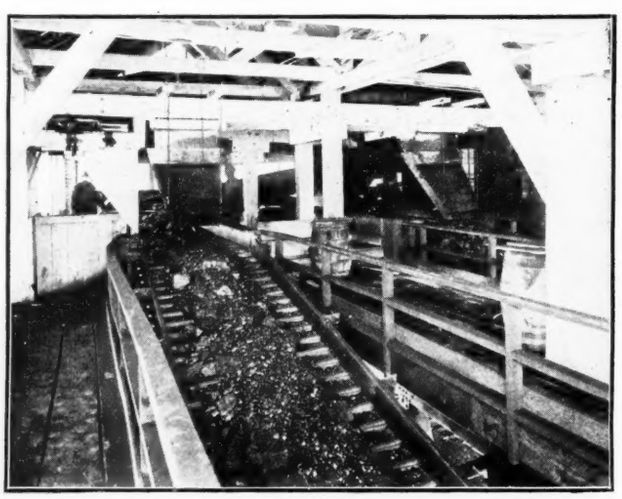
The combination nut, slack and refuse conveyor is placed about 25 ft. from the center line of the tipple and screen. It is of the suspended-scraper type having flights 12x24 in. in size at intervals of 2 ft. These are carried on two strands of steel strap chain. The flights travel in a steel trough and are supported by wooden stringers faced with angle iron. This conveyor is boxed in, preventing leakage.

The cross-apron conveyor discharges nut and slack into the upper run of the combination conveyor. This run passes over the combined egg and lump picking tables at their hinge points, so that any mixture can be made of these grades, still allowing in all cases a thorough cleaning of the egg and lump coal by the pickers before the nut or slack is combined with this size.

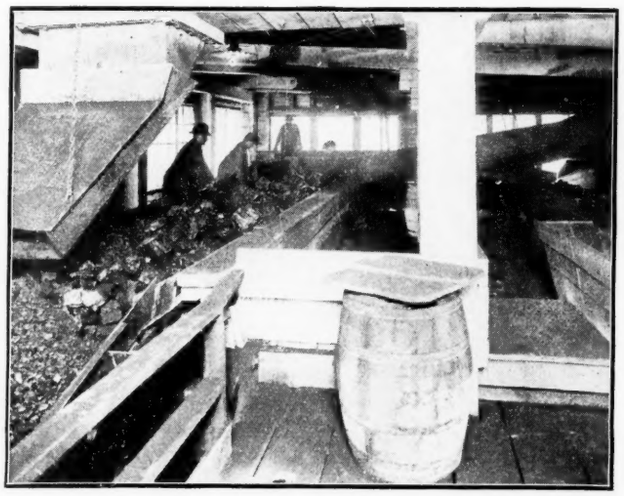
The refuse removed from the egg and lump coal is thrown into boxes placed near the pickers and over the lower strand of the combination conveyor. This refuse is therefore carried backward and upward and is discharged to a 30-ton steel-lined refuse bin. This bin is equipped with an undercut gate which discharges the refuse into mine cars, from which it is deposited on the hillside.

The lump and egg picking tables are of the standard corrugated-apron type mounted on bushed steel roller chain. They extend a sufficient distance horizontally to allow hand picking of the coal. The extremity of each conveyor is carried on a structural-steel boom which is counterweighted and controlled by an electric hoist so that it may be raised or lowered at will.

The inclined apron conveyor, the shaking screen and the cross-conveyor are driven through cast, bevel and spur



COAL PASSING DOWN THE LOADING BOOM



THE LUMP PICKING TABLE

gears, pulleys and belts, by a 35-hp. motor, the screens being actuated by ball and socket eccentrics and wooden rods from the eccentric shaft, where a flywheel pulley balances the action of the screens. The picking tables and loading booms are driven by a 10-hp motor through cast and cut gears, the nut, slack and refuse conveyor through cast and cut gears by a 20-hp. motor.

The buildings are constructed throughout of white-oak timber and are provided with numerous windows, ample stairways and trimmers' walks. Access is provided to any or all tracks by means of an elevated platform at the end of the picking house. This makes it unnecessary for those operating the equipment to go upon the railroad tracks in order to operate the cars. The roofs are covered with asbestos roll roofing, and the plant has been well painted throughout.

This plant was designed, fabricated and erected by the Link-Belt Co., of Philadelphia, Indianapolis and Chicago. L. E. and J. J. Tierney, among the pioneer coal operators of West Virginia, are respectively president and vice-president of the mining company. Z. T. Vincent is secretary, L. H. Clark, treasurer, and R. H. Heyser, general manager.

Electrical Safety Requirements

The practical requirements for safety in working electrical plants underground, Robert Nelson recently told the members of the North Staffordshire Institute of Mining, may be expressed briefly as follows: (1) Strong metallic outer coverings for all apparatus; (a) to protect insulating material from abrasion; (b) to prevent accidental contact between workmen and live parts; (c) to prevent open sparking—that is, sparking which, owing to the lack of adequate provision for preventing the ignition of inflammable gas external to the apparatus, would ignite such inflammable gas. (2) An efficient connection to the earth for the metallic outer coverings before mentioned. (3) Provision for automatically interrupting or making a faulty circuit dead immediately leakage of current begins to develop.

Items 1 and 2 can as readily be provided for in continuous as in three-phase transmission. Item 3, on the other hand, can more conveniently be provided for in three-phase operation.

Economic Aspects of the New Anthracite Sizes

SYNOPSIS—Explanation of the underlying motive for the proposed changes in the standard sizes of anthracite. The gains and sacrifices which would result to consumers of the present-day standards and the economic desirability of the change.

A clear understanding of the motive behind the proposed radical changes in the standard sizes of anthracite can only be arrived at by a study of the market conditions as viewed by the anthracite operators.

The multiplicity of the present sizes and the difficulty of economically and efficiently transporting these to the market have been advanced as the chief reasons for the proposed change. It is expected that this will result in greater economy and efficiency in preparing the coal for the market and transporting, storing and selling it. These are excellent arguments, but the underlying motive for the change is far different. It is an economic one, by which it is hoped the anthracite mines may be worked more advantageously than is done at present.

Some Preliminary Considerations

The mine operator would be willing to prepare dozens of sizes of anthracite for the market if by so doing he could make a greater profit. The eight standard sizes do not worry him; but he does view with considerable alarm the fact that it is the demand for his small coals which increases, while there is a proportional lessening in the consumption of the larger and more expensive grades. The ever-increasing call for the buckwheats will result in steadily increasing accumulations of chestnut, stove and egg coal. These of course can be turned into buckwheats, but would not be profitable at the present market prices.

The valuable coals of yesterday are losing their popularity, and what a few years back was virtually a waste product is today finding a ready market. The law of supply and demand will in time remedy this condition; but meantime the demand for anthracite will greatly diminish; bituminous coal will continue to be used more and more and anthracite less and less. This is essentially the predominating reason for desiring the change.

The operator must devise ways of creating a demand for the more expensive coals as well as for the small grades. The latter find a ready market, but the price is controlled by the demand, which in turn is regulated in large part by the price of bituminous slack. The progress made during recent years in "smokeless combustion" of soft coals has been so great that the advantage of more cleanly combustion—so long the chief and paramount asset of anthracite—is rapidly being lost to hard coal. Even in cities in which the most stringent "smoke nuisance" laws are inforced, great quantities of soft coals are now being burned.

A ton of marketable coal necessitates the mining of 47.8 cu.ft. of mine-run coal, though a long ton of marketable coal usually contains slightly less than 41 cu.ft. of coal. The difference is due to mine and breaker waste in the proportion of about 2 to 3. It costs just as much to get out the 47.8 cu.ft. of mine-run coal for conversion into buckwheat No. 3—the cheapest of the marketable anthracites—as for conversion into chestnut, the most expensive. Obviously, then, the greater the proportion of small coal produced from the 47.8 cu.ft. of mine-run coal, the less the possible returns to the operator. A certain proportion of fines is unavoidable, however; and though this proportion can be increased at pleasure it cannot be decreased. There is an economic apportionment of the proportions of the present eight standard sizes of anthracite that can be obtained from each 47.8 cu.ft. of mine-run coal. The average results of some years back secured by one of the important anthracite companies is given in Table 1. This record may safely be taken as representing average economical results and may serve as a standard of efficiency.

TABLE 1. AVERAGE SIZE COMPONENTS OF 1 TON OF MARKETABLE ANTHRACITE

Size	Per Cent.	Cu.Ft.
Broken	12.05	4.90
Egg	14.95	6.10
Stove	27.50	11.20
Chestnut	20.50	8.33
Pea	12.50	5.10
Buckwheat No. 1	10.20	4.20
Buckwheat No. 2	1.40	0.60
Buckwheat No. 3	0.90	0.40

1 ton (2,240 lb.) marketable coal; 47.8 cu.ft. mine-run coal

Determining the New Sizes

Fixing the value of the various sizes is not so simple. The present-day values are not logical, nor do they represent equitable returns. The prices prevailing two or three years ago were fairer, for though the returns were not then entirely satisfactory to the operators they were much more equitable than they are today. Prices current in November, 1913, at some of the important anthracite mines may be accepted as indicative of what may be termed the "true value" of anthracites. Such prices are listed in Table 2, together with the proportional value of the various size components of 47.8 cu.ft. of mine-run coal as given in Table 1.

TABLE 2. MINE PRICES OF AVERAGE TON (2,240 LB.) MARKETABLE ANTHRACITE (NOVEMBER, 1913)

Size	Price per Ton	Proportional Value per 47.8 Cu.Ft. Mine-Run Coal
Broken	$3.50	$0.42
Egg	3.75	.56
Stove	4.00	1.10
Chestnut	4.15	.85
Pea	2.50	.31
Buckwheat No. 1	1.50	.153
Buckwheat No. 2	.70	.01
Buckwheat No. 3	.45	.004
Average value per 47.8 cu.ft. mine-run coal		$3.407

The sum of the proportional value of the various size components of 47.8 cu.ft. of mine-run coal being the average value of a ton of marketable coal—$3.41—the average value of a cubic yard of mine-run coal is only 64c. This price compares very favorably with the actual cost of production, including all charges, and any increase in the percentage of small coal will reduce it sharply. An increased demand for buckwheats and a lesser demand for the prepared sizes have just this effect, for it means the accumulation at the mines of the more expensive fuels or material sacrifice in converting them into the small coals.

By combining certain of the present-day standard sizes it is hoped to prevent an accumulation of any particular size at the mines; and if this can be done without sacrificing any of the mine-run coal, the operators will protect themselves and at the same time conserve the value of the anthracite deposits. The plan proposed has a possibility of even bettering this, for the logical price of the new sizes, composed of two of the present standard sizes, will naturally lie between these two components.

The proposed sizes, their composition in present-day sizes, with the percentage of each that may be expected from 47.8 cu.ft. of mine-run coal—the percentages of Table 1 being taken as a measure of efficient preparation—together with the value of each new size of the 47.8 cu.ft., as indicated by the prices current in November, 1913, are given in Table 3.

TABLE 3. PROBABLE NEW ANTHRACITE SIZES AND THEIR MINE VALUE

New Size	Composition	Proportion, Per Cent.	Value Proportional	Value Per Ton
Furnace	Broken	27.0	$0.98	$3.63
	Egg			
Large range	Stove	27.5	1.10	4.00
Range	Chestnut	33.0	1.16	3.52
	Pea			
Buckwheat	Buckwheat No. 1	10.2	.153	1.50
Steam	Buckwheat No. 2	2.3	.014	.61
	Buckwheat No. 3			
Average value per 47.8 cu.ft. mine-run coal			$3.407	

Proportional value denotes the value of the particular size prepared from the average 47.8 cu.ft. mine-run coal.

The proportion of furnace coal will be the sum of the present percentages of broken and egg sizes, and naturally its proportional value will be the sum of the values of the two present sizes, as given in Table 2, which equals about 29 per cent. of the total—$3.41—value of 47.8 cu.ft. of mine-run coal. The proportion and value of large-range, formerly stove, and of buckwheat, formerly buckwheat No. 1, remain unchanged, of course, while the proportion and value of the other new sizes—range and steam—are fixed the same as in the case of furnace.

Fixing the New Prices

The price of furnace should be less than that of egg coal, because of the presence of the cheaper broken grade; but it must be greater than the price of the latter, on account of the addition of the higher-priced product. The egg component increases the value of the mixture, while the broken grade tends to cheapen it. The logical price would depend on the preponderance of one or the other of the two component sizes. If the same efficiency in preparation is exercised as the standard given in Table 1 and the individual prices of the two components are taken as those current in November, 1913, the logical price for the new grade would be $3.63 per ton at the mines, or 12c. cheaper than the price of egg and 13c. more expensive than broken (see Table 2). The logical prices for other of the new sizes, listed in Table 3, are arrived at in a similar manner.

The value of the various proportions of the new sizes totals, as before, to $3.41, and it is hoped that the new arrangement of sizes will enable this value of 1913 to be reëstablished, if not bettered. That such a result can be attained, if the new sizes are universally adopted, is not at all improbable.

The consumption or sale of all coal mined will require that the consumers of the new furnace grade equal the sum of the present consumers of broken and egg. The former, representing approximately 45 per cent. of the new market, would have to pay approximately 13c. per ton more for their coal. On the other hand, 55 per cent. of the consumers of furnace, those now burning egg, would be benefited by a reduction of about 12c. per ton. This would be a decided advantage and would have a tendency not only to hold the egg market but to stimulate the demand for the new size, possibly resulting in an increase of the price of furnace at the mines. The demand for large range and buckwheat should be about the same as at present for stove and buckwheat No. 1 respectively, prices and supply remaining about the same.

TABLE 4. EFFECT OF PRICES OF NEW SIZES ON CONSUMERS

Increase in Cost — Proportion Effected, %	Increase in Cost — Amount per Ton	Size	Decrease in Cost — Proportion Effected, %	Decrease in Cost — Amount per Ton
45	$0.13	Furnace	55	$0.12
38	1.02	Range	62	.63
39	.16	Steam	61	.09

Advantages Gained by the Change

In the case of range, greater speculative possibilities would be encountered. The present-day consumers of pea, constituting about 38 per cent. of the market using range coal, would be called upon to pay something like $1.02 per ton more for their coal. The present users of chestnut, on the other hand, would realize a saving of about 63c. per ton. The heavy additional burden to the present users of pea would most certainly cause some consumers to adopt buckwheat. This change has already taken place in many instances, so that the additional abandonment for buckwheat should not be very marked.

The present users of chestnut would be greatly benefited. The possibility of substituting pea for the more expensive coal being removed, a marked impetus to the range market would be reasonable to expect. This increase should more than counterbalance any loss incurred by the present users of pea adopting the use of buckwheat. This would enable the operators to dispose of all their present chestnut and thereby guard against accumulations of their present most valuable product.

Placing this new steam coal on the market would standardize an excellent power-house fuel and would put a stop to the present tendency on the part of so many plants and municipalities to adopt barley as a fuel for reasons of economy. The present-day consumers of barley—about 39 per cent. of the logical consumers of the new steam coal—would have to pay about 16c. per ton more than the prevailing price; but the big consumers of rice would be the gainers to the extent of about 9c. per ton.

Should the new sizes of anthracite be universally adopted, the coal movement would unquestionably be as good as or better than it was in November, 1913, which market was assumed as a basis for these conclusions. Material advantages would accrue in the way of reduced coal prices to the present consumers of egg, chestnut and buckwheat No. 2. Opposed to this would be increases in the prices of coal for users of broken, pea and buckwheat No. 3. The number of consumers that would profit is larger than the number that would be called upon to carry a heavier burden, though the gain in all instances would be numerically less than the sacrifices demanded of the others.

The probability of the new anthracite sizes being adopted depends upon whether more consideration is given to the saving in coal bills by those benefited by the change or by those whom the change would affect adversely.

Those that would have to pay more for fuel would certainly register many complaints and fight the change. It will therefore remain for those who would be benefited to make an even greater disturbance.

Other Opinions

A representative of one of the anthracite mining companies had the following to say when asked his opinion on the subject of a change in the sizes of coal:

When first proposed, this change seemed to contain some very good features, especially since it offered a chance to combat the legislators who evidently think a tax on coal a legitimate source of revenue. The labor end of the industry also forced the matter by its inordinate demands. As a result, any suggestion offering a way out found the operators in a receptive mood.

Early consideration of the problem naturally turned to the competition between the steam sizes and bituminous coal, and it was essential, of course, to avoid a condition that would tend to increase the consumption of bituminous coal. The proposed change in domestic sizes, therefore, seemed to offer the easiest solution, and a year ago some shippers began planning a change in their mechanical devices.

When it came to figuring out the cost of making a change in grates to accommodate smaller domestic sizes, a difficulty appeared quite as menacing as is competition with bituminous in junior sizes. If a change of price in buckwheat sizes would cause users to patronize soft coal, would it not be equally dangerous to tamper with users of domestic sizes? The possibility of a greater loss to the operator resulting from domestic consumers turning to gas or devising means of burning the junior sizes in their grates discourges such a change.

Building up a market for rice coal was a slow process. Its use is admittedly satisfactory, but it is now felt, and with some justification, too, that the education of rice-coal users has been accomplished at too great a sacrifice to the producer. It would appear that instead of mixing egg and stove, and chestnut and pea, the better plan for getting the needed revenue lies in advancing the price of the junior sizes.

Following is the opinion of a mechanical engineer and practical user of coal:

A mixture of sizes such as proposed is not practical because it will not burn. Experience shows that the smaller-size coal will run to ash, while the larger grade remains but half consumed. Furthermore, there has not yet been constructed a jig that will do the work satisfactorily; neither will a spiral system handle it in the way market conditions demand.

There seems to be no standard among users of domestic sizes in relation to furnace coal. Egg coal properly fed to the furnace will retain a live fire where the higher-priced stove size will burn out in half the time. There is very little demand for broken coal now, although it offers best results for moderate furnace users, containing fewer impurities. Broken coal is now almost as large as what was formerly marketed as steamboat, while Nos. 1 and 2 chestnut and Nos. 1 and 2 pea size, such as the lower Schuylkill operators furnished, have almost entirely disappeared.

This tendency to reduce the number of sizes suggests attention to a more economical use of the steam grades. It has been fully demonstrated that mixing different sizes of coal under boilers does not solve the problem of cheap steam. It is invariably found that the larger sizes are only half consumed. It has of course enabled the users to dispose of the fine sizes, but even with improved blowers the results are not as satisfactory as when using a well-prepared coal of uniform size.

To overcome some of the almost immeasurable waste following the use of anthracite coal many devices have been adopted, but even with the best so far invented there is still an enormous loss, and the methods are far from perfect.

Following Up Costs — The average anthracite operating head has, coming over his desk twice a month, an analyzed detailed cost-sheet for each and every mine opening, showing the cost per ton for the different items of mining. These are followed up with the greatest of care with the foremen and division superintendents, and they are held responsible for and obliged to explain the slightest shade of increase. A variation of only a few cents per ton in a production of several million tons a year means the difference between profit and loss. The day is probably coming when, instead of having a semimonthly cost, there will be a weekly cost, and it is not improbable that there may be eventually a daily cost sheet.

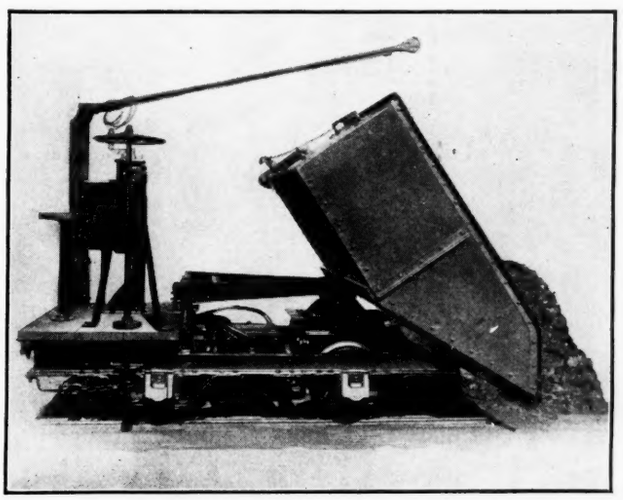
Self-Propelled All-Around Dump Car

A material reduction in the cost of disposing of waste material is the purpose of a motor-driven all-around dump car now made by the Orenstein-Arthur Koppel Co.

Usually when handling waste material a track leads from under the tipple to a dump, and ordinary mine cars hauled by mules deliver the material to the point of disposal. These cars, however, are not self-dumping, and a tipple is required for this purpose.

Under these conditions the sides of the dump cannot be built up satisfactorily, as the material is discharged to the front. Moreover, the tipple must be continually moved forward as the made ground reaches the track level.

A motor-driven car of the type mentioned does away with all the disadvantages of the foregoing method. The car shown in the accompanying illustration can be handled easily by one man. The dump can be built up to both sides or to the end, as desired. The speed of travel is



THE CAR DISCHARGING ITS LOAD

relatively high, and no special dumping mechanism is needed at the disposal point.

The dimensions of the car are: Length overall, 9 ft. 8 in.; width, 5 ft. 10 in.; height, 4 ft. 8 in.; and the capacity is 54 cu.ft. It is made in any gage from 36 in. to standard and is furnished for either alternating or direct current.

The Decline in Immigration

One of the chief reasons labor is scarce is because new supplies are not coming from abroad. How this supply has steadily declined since the war began is shown by comparisons published in a bulletin issued by the Bureau of Immigration. The appended table gives the immigration by months in the past four years:

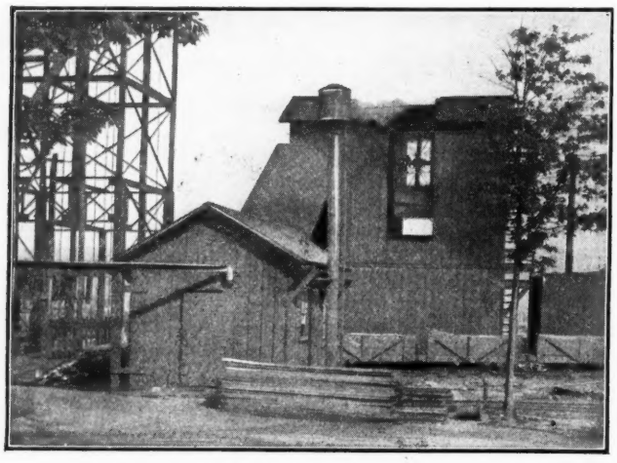
	1916	1915	1914	1913
January	17,293	15,481	44,708	46,441
February	24,740	13,873	46,873	59,156
March	27,586	19,263	92,621	96,958
April	.....	24,523	119,885	136,371
May	.....	26,069	107,796	137,262
June	.....	22,598	71,728	176,261
July	.....	21,504	60,377	138,244
August	.....	21,949	37,706	126,180
September	.....	24,513	29,143	136,247
October	.....	25,450	30,416	134,140
November	.....	24,545	26,298	104,671
December	.....	18,901	20,944	95,387
Total	69,619	258,678	668,495	1,387,318

Open-Running Fans

By E. B. Wilson*

Ten years ago the Delaware, Lackawanna & Western collieries around Scranton were equipped in part with open-running fans. As most engineers were accustomed to closed fans, with evase chimneys, they looked at these ventilators with amazement and, like myself, probably had some decided opinions of their own as to their efficiency. As the last of these fans are now being replaced by modern inclosed machines and there will soon be none left, an illustration is here presented for the benefit of those who have never seen them.

The fan here shown was running at the time the photograph was taken. This shows its high speed as well as the central partition so that the wheel may receive the air from both sides. The designer of this machine (we do not know who he was) made a step in advance from the



THE OPEN-RUNNING FAN IN OPERATION

Guibal fan when he introduced this partition, which modern fan builders have not hesitated to copy. One of the disagreeable features in connection with the Guibal fan was the pounding at the throat whenever the speed was changed or the pressure varied. To overcome this the modern fan builders, instead of making use of the sliding shutter, changed the shape of the casing or else altered the position of the fan relative to the volute.

There being no casing surrounding the open fan, the pounding was eliminated without either sliding shutter or carefully designed and expensive volute. Here again an improvement was made and probably without loss in efficiency. Guibal fan designers, in order to obtain high tangential speed at the tips of the fan blades, increased the size of the wheel. Consequently fans will be found in the anthracite fields whose diameter is 40 ft. or possibly even more. Modern fan makers obtained the same results by making wheels of less diameter and driving them at higher speeds.

The designer of the open-running fan forestalled the modern fan maker in this respect also. About the only remaining feature wherein modern fans differ from the ancient open-running machine is the volute casing, and to me there is a quaver of doubt whether this is really an improvement.

*Scranton, Penn.

If one considers that the exhaust fan creates a vacuum and then compresses the air to expel it from the chimney, there appears to be more work placed on the inclosed fan than on the open runner which simply discharges into the surrounding air. This last remark will probably cause comment when viewed from various angles, but possibly the more it is studied the more involved the subject will become and the more the reader will be convinced that the open runner is not as inefficient a fan as it first appears.

Strike Ties Up Coal Market

The strike of the marine engineers on the tugboats operated in New York harbor and adjacent waters probably causes less inconvenience to the coal trade than to any other industry. This is due to the lack of demand for coal. Dealers are not stocking up, owing to the failure of the operating companies to announce the usual spring reduction, and as a result no more coal is being ordered than is needed at once.

It was estimated that about two-thirds of the more than 750 tugs in the harbor were in operation on Tuesday, May 2, and labor leaders said that this number would be reduced unless the demands of the men were met.

Coal companies and middlemen having contracts for coaling ships had to hustle to fill their contracts. In one instance a middleman offered $15 to the tug captain who would tow a loaded barge from one side of the North River to the other and tie up alongside a vessel almost ready to sail. He found no takers. For towing another loaded barge a little longer distance $25 was offered, but no takers were found.

The marine engineers have been joined in their strike by the firemen and helpers on tugboats and it was feared that the strike would extend to the longshoremen, who number about 30,000 in this harbor.

What the Deep-Sea Engineers Are Demanding

The engineers have divided their demands into two classes—one relating to steamships and the other to tugs. Chief engineers on all ships with a power tonnage of 10,000 or more are demanding a minimum wage of $225 a month; first assistant engineers, $150; second assistant engineers, $140; third assistant engineers, $130, and licensed junior engineers, $80.

The minimum wage on all single-screw ships of more than 10,000 power tonnage and twin-screw ships of more than 8,000 power tonnage shall range from $190 down, and so on through the various classes of steamships, down to boats with less than 600 power tonnage, the chief engineer of which shall receive a minimum of $125 a month, with chief engineers of boats of less than 100 tons gross receiving $105 a month.

Rates the Towing Engineers Are Seeking

The demands relating to tugs fixes the minimum on each one at from $145 a month for day men and $140 for night men on board of railroad boats down to $100 a month and board for men aboard harbor boats with single-cylinder engines.

The towing companies were all more or less hit by the strike and some of them had very few if any tugs at work. As a result the freight congestion which has been bad for several months was worse than ever before and the docks were jammed. Vessels coming into port had to make their piers under their own guidance and in this way much delay was experienced.

The labor leaders contend that many of the larger companies have conceded the demands of the men, among them being the New York Central & Hudson River Railroad Co., the New York, New Haven & Hartford Railroad Co., McWilliams Towing Co., Standard Oil Co., National Fireproofing Co. and many of the steamship companies.

Negotiations looking to a settlement of the trouble are under way with other concerns, among them the railroad companies. The labor leaders expect an early settlement of the strike.

After conferences extending over four days it was announced late on Monday, May 8, that efforts to settle the strike of the marine engineers had failed. Charges of delay were made by both sides to the controversy, but it was learned that the principal stumbling block was the demand of the engineers for four days off a month. The owners, it was said, were willing to allow two days off each month, and some also expressed a willingness to give the men a week's vacation with pay each year. It is likely that further conferences will be held. The union officials threaten to call a general strike along the waterfront.

Anthracite Companies Abandon the Circular Prices

SYNOPSIS—The evident intention of the Government to institute a rigid investigation into the proposed increases in the anthracite circulars caused the companies to withdraw these at the last moment. Uniformity of action in maintaining prices will also cease and the change in sizes will become effective immediately.

The anthracite operators, including both the individuals and the large operators who have been in conference during the past week, finally agreed upon a new price circular late Tuesday afternoon. The circular went into the hands of the printers and was to have been issued Wednesday morning. On account of the developments over night in Washington the prices were withheld and it has now been decided to cancel the circular and all companies will quote prices regardless of each other. The prices of one of the large companies at Philadelphia for May shipment are as follows:

	Line	Tide		Line	Tide
Broken	$3.60	$5.00	Chestnut	$4.05	$5.45
Egg	3.70	5.10	Pea	2.40	3.65
Stove	4.00	5.40	Buckwheat	1.80	2.90

These prices with the exception of broken and buckwheat will increase 10c. each month until a maximum of 40c. per ton is reached on Sept. 1. Broken will remain at the same price as quoted.

A remarkable feature of the present situation is that it has been decided to make the change of sizes effective at once. The screens are being changed now at the mines, and the change will be effected without renaming the sizes in any way, with one exception. The plan is merely to alter the standard of preparation of the sizes by introducing 30 to 40 per cent. of the next smaller size into the preceding one. That is, for instance, pea coal will carry 30 to 40 per cent. buckwheat; buckwheat will have the same proportion of rice, and rice and barley will be combined into a new size to be known as "boiler." Chestnut will have 30 to 40 per cent. of pea.

It is understood that it is the intention to ship the changed sizes to the dealers with absolutely no explanation. However, a number of the prominent dealers have received inklings of the plan and declare they will reject all shipments which do not come up to the old standard of preparation.

Government Investigation Threatened

It was understood early in the week that the companies were about to announce new increased circulars, coincident with which there were reports from Washington that President Wilson would cause an investigation to be made. In this connection Attorney-General Gregory addressed the following communication to the Federal Trade Commission:

It has been brought out in the various legal proceedings against the anthracite railroads that on similar occasions in the past, when wages have been advanced, the railroad coal companies, on the pretext of increasing prices for the purpose of meeting the increased cost of production resulting from the higher wages, have made much greater increases than were necessary for that purpose.

Since Jan. 1, 1900, there have been three general advances in the wages of mine workers in the anthracite regions, exclusive of the present advance. In October, 1900, wages were advanced approximately 10 per cent. In the fiscal year immediately preceding this advance (July 1, 1899-June 30, 1900) the cost of production of the Philadelphia & Reading Coal and Iron Co., whose mines are among the most expensive to operate, was $1.76 per ton. In the fiscal year immediately following (July 1, 1900-June 30, 1901) its cost of production was $1.826 per ton—an increase of 15.6c. per ton, which includes not only the increase due to advance in wages, but the increase due to all other factors. On the other hand, the same company (the others following suit) increased prices by 23.2c. per ton on all sizes, making the excess of price increase over cost increase 7.6c. per ton.

On Nov. 1, 1902, there was another general advance in wages of approximately 14 per cent. In the fiscal year immediately preceding this advance (July 1, 1901-June 30, 1902), the cost of production of the Philadelphia & Reading Coal and Iron Co. was $2.066 per ton. In the fiscal year immediately following (July 1, 1902-June 30, 1903) its cost of production was $2.199 per ton—an increase of 13.3c. per ton, which includes not only the increase due to the advance in wages, but the increase due to all other factors. On the other hand, the same company (the others following) increased prices by 49.4c. per ton on all sizes, making the excess of price increase over cost increase 36.3c. per ton.

Undoubtedly the prices immediately following the wage increase in 1902 were abnormally high, due to the scarcity of coal in consequence of the long strike. It will be fairer, therefore, to take the prices prevailing in the fiscal year ended June 30, 1904, as the basis for comparison.[1] This would show an excess of price increase over cost increase of 24.5c. per ton.

In 1912 another advance in wages took place, amounting to about 5.6 per cent. net. Again prices were increased on the pretext of meeting the resulting increase in the cost of production. On this occasion the House of Representatives directed the Bureau of Labor to make an investigation. The bureau found that, whereas the advanced wages increased the cost of production only 9c. per ton, prices were increased 25c. per ton, making the disparity between price increase and cost increase 16c. per ton.

The report of the Bureau of Labor states:

Following the agreement of May 20, 1912, the wholesale price of anthracite coal was advanced by the mining companies about 25c. per ton, when all sizes are taken into consideration. The advance in miners' wages under the above agreement and the increase in wages granted to men not specifically covered by the agreement were equivalent to an increase of between 8 and 10c. per ton in the cost of labor, or an average increase of about 9c. per ton for the anthracite region as a whole. Deducting this increase in labor cost from the increase in the selling price per ton, it will be seen that the prices realized by the coal-mining companies were increased about 16c. per ton more than was required by the new scale of wages alone. (House Doc. 1,442, p. 33.)

The attorney general then concludes: As the total consumption of some years past has been in the neighborhood of 75,000,000 tons, this excess of price increase over cost increase following the advance in wages in 1912 meant a surtax upon consumers of about $12,000,000 annually.

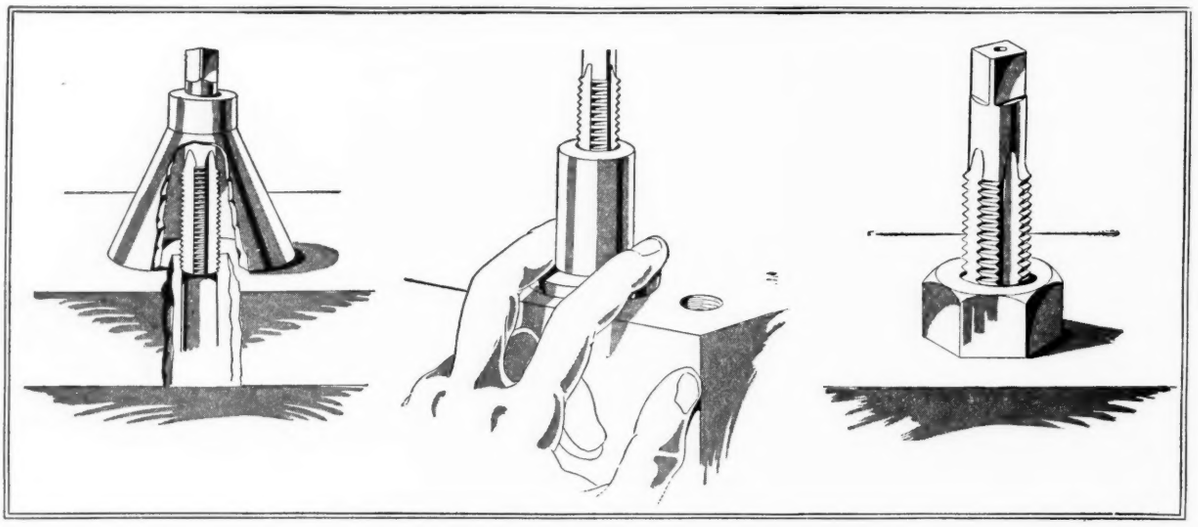
Press Opinions

The New York *Evening Sun* makes the following editorial comment on the situation:

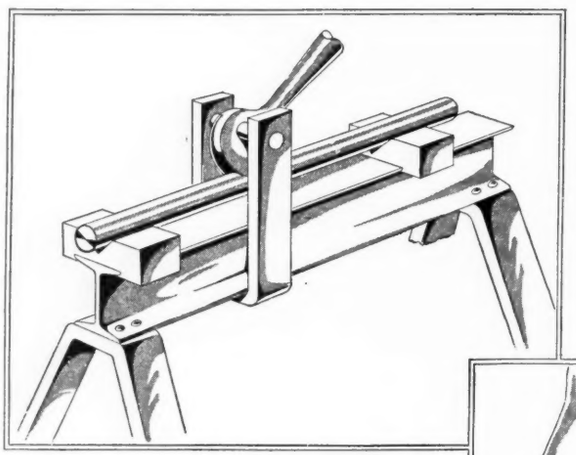
The devil, Capital, has had his trouncing, and who is to pay? Labor in the anthracite region has obtained promise of $18,000,000 more wages a year; whence is the money to come? No wizard is needed to guess that the burden will fall on the consumer of anthracite coal.

The irony of it is that the consumer, who is not conscious of ever having oppressed so much as a single coal miner and who often even sides with the miners, or at least against the operators, is at a loss why he should pay the expenses of all concerned. The coal-mine owners are rich; why not let them bear the burden? This dismay of the victim comes because of his bland ignorance of what is going on. Most of us, outside of our special tasks, are children in understanding. We open the back of a watch and look in; see a wheel or so going round, yet cannot tell how each wheel moves the next, from the mainspring to the minute hand. In the same way the conspicuous interlocking action of production and consumption quite escapes most observers.

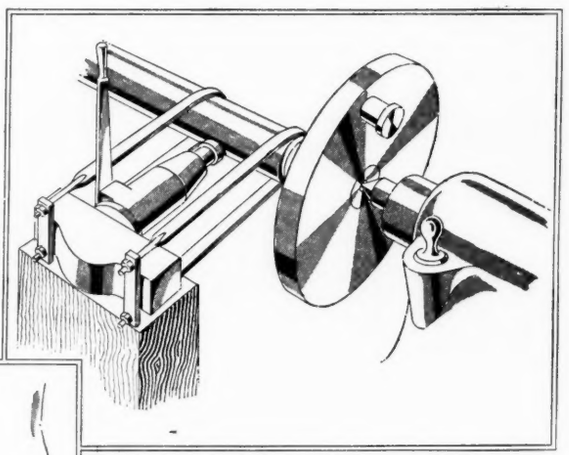
Handy Hints and Clever



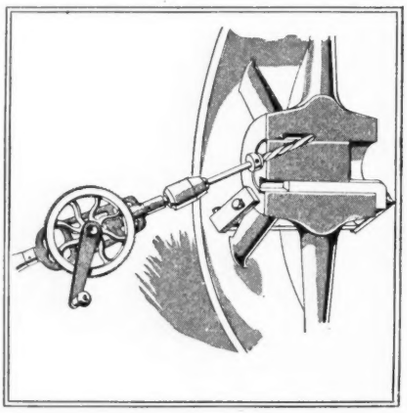
THREE DEVICES TO SQUARE UP A HAND TAP



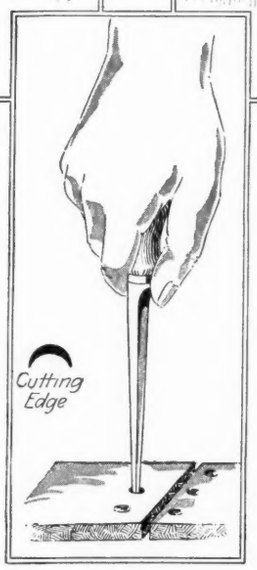
SHAFT-STRAIGHTENING PRESS



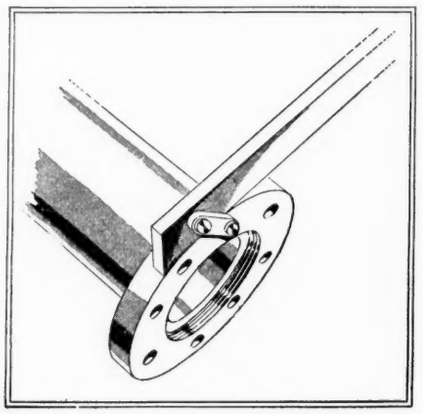
STRAIGHTENING A SHAFT



OIL-GROOVING DEVICE

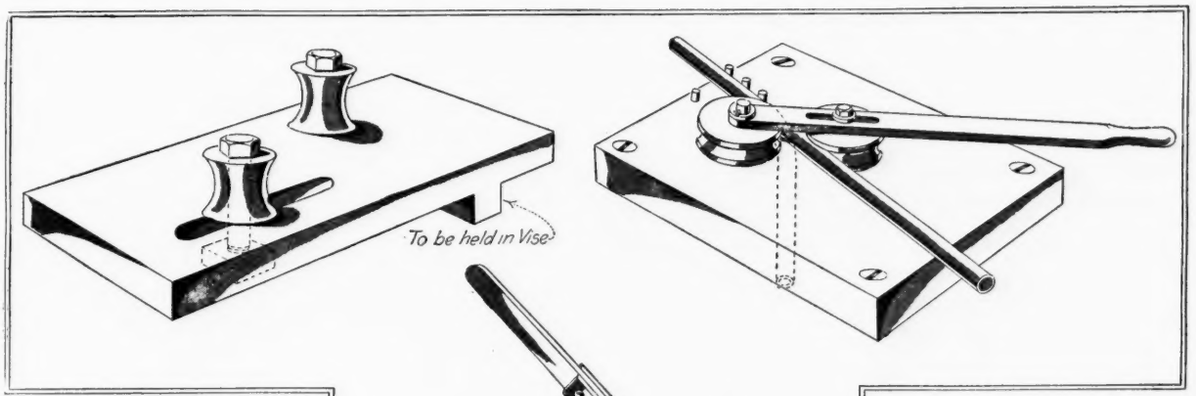


BELT PUNCH



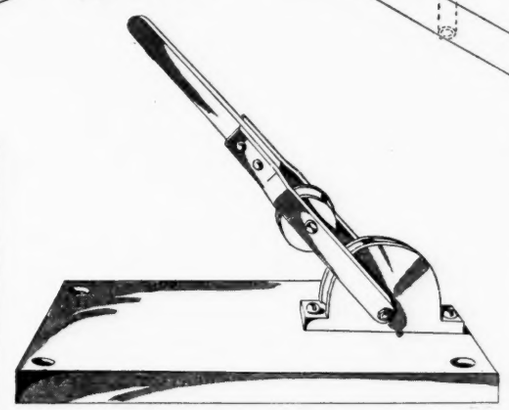
SIMPLE FLANGE WRENCH

Kinks for the Power Plant

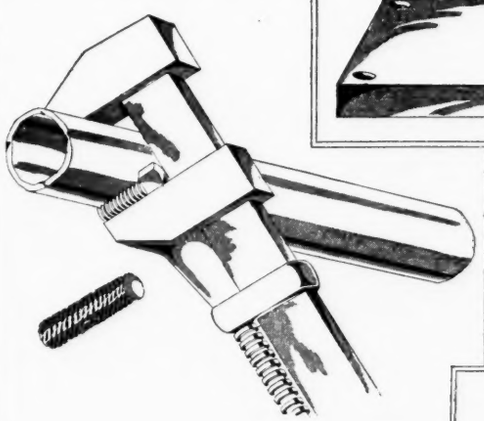


PIPE-BENDING FORM

PIPE-BENDING FIXTURE



SIMPLE PIPE-BENDING DEVICE



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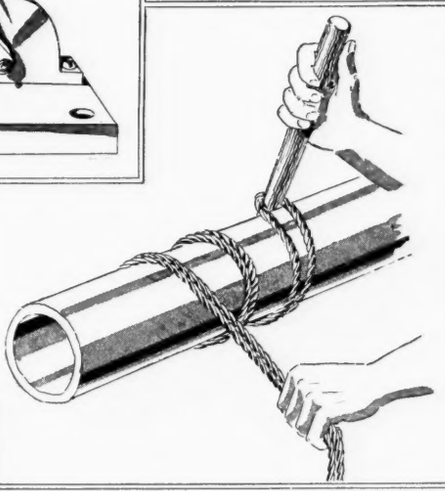

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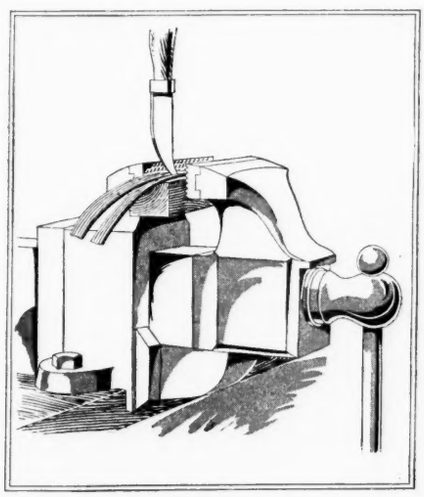

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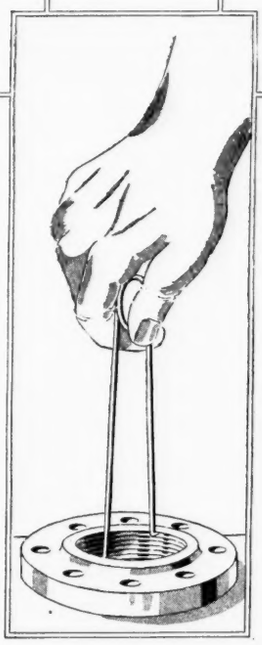

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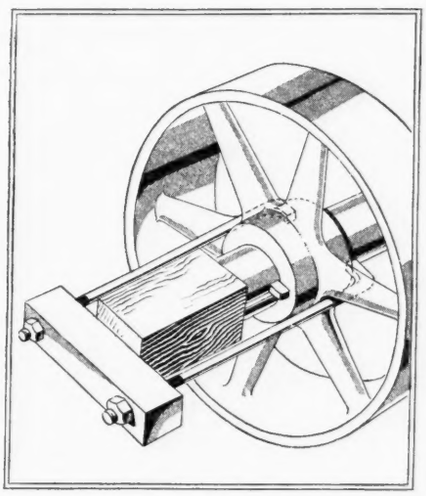


PULLEY CLAMP

The Labor Situation

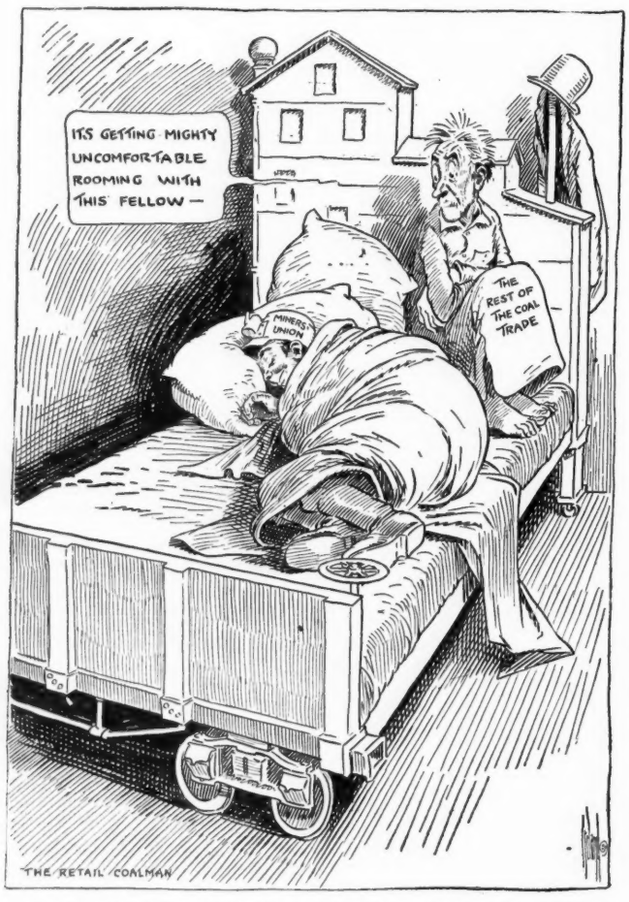
General Labor Review

The anthracite scale is finally settled for four years by its ratification in the Pottsville convention. It is now "signed, sealed and delivered," so that there is no longer a peradventure possible. It does not have to be fitted to the various districts and subdistricts like the McAlpin agreement.

Thus it happens that the anthracite contract, which is far more recent than the interstate agreement, gets into force before the difficulties in some districts under the latter contract have been settled. There were some in the convention who wanted the question of ratification presented to the miners individually in a referendum, but the proposition was defeated.

How the Delegation Viewed the Agreement

There is some trouble about the starting hour at the mines. The miners want to reserve some few hours of daylight for baseball, and there is no reason why they should not be accommodated. They regard the agreement made as defective, because it does not contain a "closed shop" clause, arguing that the tendency of "open shop" is to make the men who are loyal to the interests of their class pay all the expense of unionism, while the nonunion men receive the benefit without paying for it. Besides they fear that unless compelled to remain many men will leave the union.



THE MINER SURELY HAS A DISCOURAGING ATTITUDE

The ratification vote was as follows: District No. 1, 231 for, 107 against; No. 7, 110 for, 38 against, and No. 9, 240 for and 61 against, showing that the last—the area around Shamokin—was most strongly in favor of acceptance and the first—the area around Scranton and Wilkes-Barre—was least favorably impressed by its provisions.

Miners Fortunate To Get Powder at Old Price

The fifth clause of the contract, providing that the present prices of powder and miners' supplies shall be unchanged, was the cause of much discussion. The labor leaders rightly regarded this as a great triumph in view of the fact that the price of explosives has risen steadily since the war started. President Kennedy stated that a new contract which would have kept the prices on an even basis with the old would have cost the miners $100,000. The arrangement puts that much burden on the operator unless he can shift it, as he should, onto the consumer, for whose benefit it is incurred.

Some claimed that the powder rates at their mines were too high and they were told that their method of redress was to take the matter up with the conciliation board on the basis of the old contract.

The leaders explained to the men that the 8-hr. contract worked both ways. Not only will the companies be obliged to restrict the day workers' hours to eight, but the contract miners will also have to work the full 8 hr.

An effort was made to increase the salaries of the district officers by a percentage equal to the advance granted in the wages of the contract miners, namely, 7 per cent. but it was ruled out of order, and the matter was referred to the district convention for action. The officials received, however, a vote of thanks for their splendid work.

Why Not Post Cards Instead of Delegates?

It is clear that the vote was by no means cut and dried for delivery. There were delegates who were instructed to vote the agreement down regardless of the force of the arguments presented in its favor. Mr. White, addressing these men, said: "Your locals might just as well have mailed post cards here as delegated men to come who are not permitted to weigh in their own minds the explanations which your committee has given to you on this agreement and who are forbidden, when they have heard the argument, to render on their own initiative decisions that will satisfy their consciences."

The miners in short were acting just like President Baer. They think a divine Providence has given them charge of the mines and that only their own pleasure is to be sought. They will not argue the matter, for like Mr. Baer they believe they have been endowed with an intelligence that cannot be aided by argument or convinced by facts. Presidents White, Dempsey and Kennedy brought these men to time with telling rhetoric, informing them that the union could not go before the public for the closed shop, for "they would say, if we loved our union so much and it has done so much for us, why are we not loyal enough to it to pay it our dues?"

In the Pennsylvania bituminous fields the H. C. Frick Coke Co. has given a further increase in wages to its men, raising the pay of the lowest-paid men more than that of those who are better paid. Strikes with violence are occurring at the Ford Collieries Co.'s mines and at Big Bend evictions are threatened.

The central Pennsylvania field appears to have accepted the protocol in its referendum vote. The preliminary agreement in Illinois is signed, but has not as yet been submitted to a referendum. In Kentucky the operators are still asking for a wage cut of 20 per cent. to meet the severe nonunion competition. The miners are willing to go back to work at the old scale.

In eastern Ohio and the Crooksville and Jackson districts no agreement has been reached in conference, but the Pomeroy Bend, Guernsey, Tuscarawas and Massillon protocols are signed. In the Southwest no conference is now in session. The miners are striking for an equal division of work, desiring that not only the car-turn but the mine-turn also shall be made equal.

The cartoon which we take from the "Retail Coalman" is extremely clever, but really there is no evidence that the mine worker is getting more than he has a right to expect. The operator who is being edged off the bed is certainly unfortunate, but the trouble is that the bed is not big enough for both and not that the miner is occupying it in an unfair manner. The consumer should be made to provide a bed in which both miner and operator with due regard to each other's needs could find place without undue crowding.

Anthracite Agreement Signed

The uncertainty relative to operation in the anthracite region is definitely at an end. The tentative agreement reached by the representatives of the anthracite operators and miners at the Union League Club, New York City, early on Sunday, Apr. 30, was ratified by delegates representing the mine workers at the Tridistrict Convention at Pottsville on Thursday, May 4, by a vote of 581 to 206 and was signed the following day in Philadelphia by all the men but one, who had negotiated the contract, and was attested by Alvin Markle and James Gorman, the chairman and secretary respectively of the subcommittee of operators and miners.

The one exception was W. L. Connell, of Scranton, president of the Green Ridge Coal Co., who was unable to go to Philadelphia because of the serious illness of his sister, Miss Jessie Connell. On Saturday he signed the contract at Scranton.

The Pottsville convention had from the first been favorable to the agreement, but a few men who were violently opposed to it endeavored to stampede the meeting on its opening, May 2, by hissing during the reading of the protocol.

John Mitchell Sends a Ringing Endorsement

John Mitchell, the former president of the United Mine Workers, had sent a telegram to John T. Dempsey, of Scranton, president of district No. 1, commending the new contract and urging its ratification. This was read to the assembled delegates on the opening day and a storm of applause arose, which probably was as much a personal tribute as a recognition of the advice tendered.

John Mitchell's statement was as follows:

I take this means of expressing to the national and district representatives of the United Mine Workers my earnest congratulations upon the success that has attended its efforts to procure improvements in wages, hours of labor and conditions of employment. My sincere hope is that the delegates to the convention will unanimously and enthusiastically ratify the proposed agreement, and that its adoption will result, as it should, in the complete and permanent organization of all men employed in and around the anthracite mines.

With Sword in One Hand and Trowel in Other

The real sentiment of the meeting was shown by the ovation granted to President White. In his opening address he appealed to the delegates assembled to weigh their words and actions in deciding "the fate of the men in the anthracite coal fields." He congratulated the mine workers on the fact that because they were properly organized they had been able to continue operations pending a settlement, and he said that the miners' example is already being held as a criterion for other labor organizations. He cautioned the mine workers not to believe that because some the things that they desired, and to which they are entitled, had not been won that they have been lost for all time.

The expected opposition developed on Wednesday, some delegates expressing themselves strongly against any agreement that did not include the "closed shop," while others condemned other portions of the new contract. Nevertheless, the union officials who had labored with the operators for two months felt sure of securing its adoption. The contract was taken up seriatim and each section was explained at length by members of the scale committee. No vote was taken on the various sections, the convention's only recourse being to accept or reject the contract in its entirety.

Majority for Agreement Is Over Two to One

Consideration of the agreement was resumed on Friday and continued until after 4 p.m., when a standing vote was taken, with a result that showed 407 in favor of the protocol and 117 against. This was not satisfactory to some of the opposition leaders and they asked for a roll-call. The latter showed 581 in favor of the agreement and 206 against it. The officers were tendered a vote of thanks for their work in negotiating the contract.

Bitterness against the agreement continued throughout the session on Friday and an effort was made to refer it to a referendum vote of the mine workers, but this was checked by the union leaders. The arguments of the opposition were weak and it was early apparent that the agreement would be ratified.

During the discussion Mr. White took occasion to say to the delegates that he could not say what the outcome would be in the event "that you decide that you can secure more through strife than we have been able to get for you through peaceful negotiations, but I want you to consider well what the consequences of such action will be." He said the contract did not represent all that the miners want, nor what they are entitled to, but it was the best that could be obtained at this time. President Dempsey spoke in a similar strain.

The day following, Friday, the agreement was signed in the office of W. J. Richards, president of the Philadelphia & Reading Coal and Iron Co. in Philadelphia. It dates from Apr. 1, 1916, and expires on Mar. 31, 1920.

Pennsylvania Bituminous News

On May 6 the H. C. Frick Coke Co. raised wages from 5 to 10 per cent. Only a few weeks ago the same company gave its men an increase of about 10 per cent. The W. J. Rainey Coke Co. and other companies immediately posted notices that they would pay the Frick scale. The increase is largest to the common laborers—namely, 10 per cent.; other workmen are given 5 per cent. increases.

This change is in accord with the spirit of the minimum wage. It is questionable whether the low wage of the man at the bottom has done as much to induce him to make efforts to climb up and increase in efficiency as it has done to make him listless and effortless from sheer discouragement. Besides, the best workers among us today are almost socialistic enough to do their utmost for the pleasure of accomplishment rather than for a base money reward. About 40,000 men are gainers by this liberal wage adjustment.

Ford Collieries Have to Seek an Injunction

The Ford Collieries Co. is having more trouble. The miners have broken faith with their union, the United Mine Workers of America, with whom the Ford Collieries Co. signed an agreement on Mar. 16, and they have been trying to get the 1,000 men which the company employs to violate their agreement and go on strike.

If the facts are as recited, surely the company is fully justified in asking for an injunction to restrain them. The preliminary injunction names John Fetlock and 14 others who are endeavoring to induce the miners of the union to leave their work. The three mines involved are located near Curtisville and Bairdville, West Deer Township, Allegheny County.

On May 3 the strikers prevented any one from entering the mines to keep the pumps at work, though the workings were rapidly filling with water. The strike received no little impetus from the bad example of the rioters at Braddock and several fights occurred between those who wanted to work and those who desired to strike.

It is to be hoped that the union, which guarantees peace to those who give its affairs into its gracious keeping, will not be unduly annoyed that the Ford Collieries Co. despairs of assistance from the union lieutenants and goes to the courts for the help which the union is powerless to provide.

Central Pennsylvania Will Ratify Agreement

Before the agreement between the scale committees of the miners and operators representing district No. 2 of the United Mine Workers in the bituminous regions becomes effective, it must be accepted by a vote of a majority of the members of the United Mine Workers in the district. The month's conference in Philadelphia, which resulted in an agreement and a scale for two years from Apr. 1, would count for nothing if the work was not approved by a majority of the men, and a vote on that agreement has been taken at the different mines, May 8 being the day set for the last vote to be recorded, after which the result will be announced from the district office of the United Mine Workers at Clearfield.

There are 175 local unions in the district and the first 60 of them to make returns, comprising many of the largest mines, reported votes that were unfavorable to the agreement. Many of the mines along the main line of the Pennsylvania R.R., and a few of the larger operations in Clearfield, Indiana and Jefferson counties, returned votes against the scale. After the vote of the first sixty local unions had been counted in the early part of the week it was found to be almost unanimous against the acceptance of the wage agreement. For a while it looked as though it would be almost impossible to avoid a strike, although the scale proposed is the best that the men have ever had.

The vote received later in the week, however, promised to show a different result, and when 85 locals had reported, the tide had turned, and the vote still out is expected to be in favor of the agreement. James Purcell, president of District No. 2, declares that it is too early to predict a result, although the officials all have optimistic views and believe a strike will be avoided. Evidently several local unions opposed to the Philadelphia scale were anxious to record their opposition in a telling way and to accomplish that end they forwarded their votes early.

Several hundred miners are on strike at the mines of the Commercial Coal Mining Co. at Big Bend near Expedit, Penn., on the Ebensburg and Black Lick Branch of the Pennsylvania R.R., in Cambria County. The company has threatened to evict 21 miners and their families. These men will be cared for by the union. It is alleged that the company failed to cut the coal for its men and refused to pay them the same wage scale paid in other mines for cutting and mining. William Welch, district organizer of the United Mine Workers, on May 5 issued a statement on the causes of the Big Bend strike.

Hocking Valley Wage Contract

The first 15 rules of the preliminary contract between the operators and miners of the Hocking Valley signed at Logan, Ohio, were published last week with the wage scale. The rest were crowded out for lack of room and are given in the following paragraphs. The district over which the scale is operative comprises Athens and Hocking Counties and Perry County south of New Lexington. John S. Winder, the president of the Sunday Creek Coal Co., has stated that the three mines still remaining in the possession of that concern will open shortly.

16. It is understood and agreed that in entries of regular height, and where no horseback, clay vein or other foreign substance exists, no average will be paid.

In deficient entry, where it is necessary to take down slate to make a roadway of the right height, the loader will shoot and load the same.

Where rock is encountered it shall be drilled and shot down by the company and loaded by the loader. Where deficient entry is driven and rock or slate is handled by the loader, the established average tonnage of said entry or mine will be paid.

Each crossing shall be cut full width and depth, unless otherwise ordered by the company; and the manner of counting said crossing shall be the regular depth of machine as determined by tape measure.

The coal shall be mined in a workmanlike manner, so as to produce the greatest amount of lump coal, and each car shall be checked with a check of the man doing the work.

Where the company wishes to drive deficient entry by the day, the price shall be $4.20 per day, the company having the right to select its men, but the man working the place is to have the preference.

It is understood and agreed that in isolated entries, when necessary, men shall be permitted to cut, load and haul their own coal. In this event cutting and loading shall be paid for at tonnage rates, and the men doing the work will make an agreement with the mine boss as to the pay for hauling.

Where rock drilling and shooting in deficient entries is done by hand, the rate per day shall be $4.20. Where done by electric drill, the minimum rate per day shall be $2.98.

17. Double-shaft entries and breakthroughs between entries shall be driven for 34.986c. per yard.

Men and Managers To Accommodate Each Other

18. When necessary, day men shall work on idle days, or, in case of emergency, overtime; but such work shall be distributed as equally as possible among employees. The operators reserve the right to work skilled labor upon days when the mine is idle, or for an extra shift in cases of emergency.

19. Drivers and other day men shall work under the direction of the mine boss or superintendent and shall perform such labor as may be required of them, but they must be paid the scale of wages provided for the labor which they are required to perform.

20. When any employee absents himself from duty for two days, except in case of sickness, and fails to give advance notice to the mine boss, where possible, he forfeits his position.

21. Where cars are promised and are on the way between the yards and mine at starting time in the morning, the men shall wait up to and not less than 30 min.; provided, however, that where satisfactory local arrangements exist for waiting for cars, the same shall remain in force and be observed.

22. In emergencies the company shall have the right to make the noon hour one-half hour earlier. All day men affected shall be notified in advance of this variation of the noon hour.

23. The miners shall be allowed one afternoon a month to hold a meeting, if they so desire and if such a meeting is necessary. The afternoon shall be chosen by agreement between the management and miners at the different mines. No meetings other than those provided herein shall at any time be held during working hours.

24. No local rules or orders that interfere with the provisions of this contract shall be made or given by either miners, operators or their agents.

Must Draw Men Equally for Special Service

25. If a machine man, driver or other day man fails to appear for duty, a man may be taken from a working place, "the man taking either's place to get such turn for one day each pay."

[Apparently this means that the men accommodate the company in this manner in turn and no man may be required to act as a supply more than one day in each pay period.]

26. If at work time in the morning, under normal conditions, four men are out of cutting or rails in any one territory, and upon investigation by the mine boss and the committee it shall be found that their delay is the fault of the company, the men shall be furnished work by the operator; but in no case shall a breakdown or an unavoidable accident be considered the fault of the company.

It is agreed that in case of any local grievance at any mine the aggrieved party or parties and the mine boss shall first make an earnest effort to adjust it.

If they fail to agree, the matter in dispute shall be referred to the mine foreman or superintendent and mine committee. If they fail to agree, it shall then be referred to the general manager of the company involved, or his representative and the president of subdistrict 1 of district 6, U. M. W. of A., or his representative. In case they fail to agree the matter shall be referred to the president of district 6, U. M. W. of A., or his representative, and the representative of the Hocking Operators' Association.

All controversies arising under the terms of this agreement shall, without delay, be taken up for adjustment as herein provided.

28. No strike or stoppage of work shall occur at any mine until the matter has been taken up with the officers of subdistrict No. 1 of district No. 6 of the U. M. W. of A. and the company affected or until these parties have taken up the matter as provided in Section 27. But to this rule there are two exceptions, strikes and stoppages of work being permitted where, without explanation, the company fails to pay on the regular pay day or where the weigh scales are broken down.

(a) Should any local officer, or officers of any local union or any member thereof, employed at any mine, cause the mine to shut down in violation of this rule, each member of the United Mine Workers of America employed at said mine, except those who continue at work, shall have deducted from his earnings the sum of $1 per day for each day or part of a day he remains idle.

(b) Should any operator or his representative lock the men out for the purpose of forcing a settlement of any grievance, or cause the mine to shut down in violation of this rule, he shall be fined $1 per employee so idle for each day or part of a day that operation of the mine is thus prevented. It is agreed that the stoppage of the mine as provided for in Section 6 of this contract shall not constitute a violation of this rule.

(c) All moneys assessed against the employees under this rule shall be collected from the pay for the half month in which the violation of the rule occurs, or from the first moneys due thereafter, and said moneys so collected shall be turned over to the proper officer of subdistrict No. 1, district No. 6, U. M. W. of A. All moneys assessed against the operator for violation of this rule shall be paid over to the Hocking Operators' Association.

Under no circumstances shall the subdistrict or the Hocking Operators' Association refund money so paid. The company shall furnish the local secretary a list of money so collected and paid over. It is understood that fines shall take precedence over all other collections.

29. All things being equal, sons of members of the United Mine Workers of America when they reach the proper age shall, on going into the mines, be given preference.

Rule Regulating Height of Mine-Car Loading

30. No limit shall be placed on the weight which may be loaded on mine cars, and in case of loss of coal in transit the company shall not be held responsible, except where the cars are broken by employees or where a wreck occurs. In that case the miner shall be allowed the average weight for the cars broken or wrecked. In order that miners may not take advantage of this clause, the mine manager and the committee of any mine where complaint is made of loading cars over their capacity shall mutually agree on a standard height for loading cars.

31. In case of a local or general suspension of mining, either at the expiration of this contract or at any other time, the engineers, firemen, pumpers and other men necessary to keep mines in shape shall not suspend work, but shall, when the mine is suspended, fully protect and keep in repair all the company's property under their care, and operate fans and pumps, and lower and hoist such men or supplies as may be required to keep up steam at the company's coal plant; but it is understood and agreed that the operators will not ask them to hoist any coal for sale on the market which has been produced by nonunion labor. The rates to be paid for such work shall be those in effect at the time of suspension, subject to any subsequent settlement.

32. The system of checking off for the United Mine Workers' organization remains in force and must be observed, the amount to be collected being determined as a percentage of earnings. The check-off shall include all dues and assessments for the burial fund and the United Mine Workers' organization.

No fine shall be collected except it is ordered by a majority vote of the members present at a regularly called local meeting.

However, should either the operator, the local union or the party upon whom the fine is imposed object to such fine, each of them shall have the right to appeal to the subdistrict officers and the operator or the operators' commissioner for final ruling.

In order to be honored, check-off figures must be furnished to the company by noon of the first and by noon of the sixteenth of each month.

33. It is understood that companies operating two or more mines will work all the mines on turn as nearly as possible or as nearly as market conditions will permit. When it is necessary for any one company to close down one or more mines on account of market conditions it is agreed that the men employed at said mines shall be entitled to work at those still remaining in operation, and the company shall distribute the men proportionately in such mines. It is understood that all classes of labor agreed upon by the mine foreman and committee shall under these circumstances share their work. Nothing in the foregoing shall be allowed to interfere with or affect the efficiency of the mine work or the quality of the output.

34. Conditions governing all employees in and about the mines prevailing during the year 1914 and 1915, and not specifically covered in the above rules and conditions shall remain unchanged. But any local concession made heretofore by any miner or operator at any mine shall be open to him for adjustment.

Anthracite Operators Were Justified—In their first manifesto to the public the anthracite operators did not in any way overstate conditions. Their contention is written purposely on the basis of the 1902 award and on the report of the commission when it made its decision. But in 1900 there was an increase in wage of 10 per cent., and 1901, the year chosen from which to calculate the improvement in the regularity of work, was one of exceptional activity. The miners worked 196 days, whereas the following were the runs from 1896 to 1902, inclusive: 174, 150, 152, 173, 166, 196 and 116 days.

Editorials

Expensiveness of Cheap Fuel

The mine operator is disposed to look somewhat blindly on the power-plant problem. He makes up his mind too often that as he must sell his slack and "bug dust" for practically nothing, no matter what it costs him, he need not put in the best types of boilers in order that he may use such cheap fuel with economy. Later he finds too often that the better class of coal which he could sell is going to those same boilers when his back is turned. The firemen and foremen are having results demanded of them, and they insist on the best of coal being given them so that they can get the utmost out of the boilers.

In most cases, enough steam could be made with fine coal to furnish the power if the steam were not wasted in use. Even more, sufficient steam could usually be raised with finer fuel and the present boilers to supply both lawful and wasteful uses if economy and the right methods were used in the boiler room. But instead, another boiler is added to the lengthening line. The set you have plus intelligence would serve as well as, or better than, the same set plus another boiler, and the plant would not be made dirty by a constant pall of smoke.

If we could get the best of coal absolutely free of cost delivered right on the boiler-room floor it would not pay to waste the fuel, for it takes equipment to waste it and men to run the equipment. Also, sometimes it is an important item that it takes much good water to raise a sufficient quantity of steam to permit of such wastes. Repairs cost too much money where there is an excess of units. Deterioration is the more rapid when everything is not kept in order. So the operator cannot laugh at waste just because his coal is free. The cheapness of his fuel is only a trap in which he may be caught.

The Right of a Mule

Facts which are well known to everyone and effects which might be regarded as probable if not even certain should the right circumstances arise sometimes require a decision in the courts to fix their legal status. Everybody knows that mules are wont to use their heels both for offense and defense. Nevertheless the Court of Appeals in Kentucky was recently called upon to decide that "to kick is a mule's inalienable prerogative."

A man employed as a mule driver by the Consolidation Coal Co. brought suit against the company for damages. These were to cover injuries received at the heels of a mule behind which he had stooped down to pick up a chain, at the same time striking the animal across the legs with his whip. In the lower court he received a verdict for $500.

The Court of Appeals reversed the decision of the lower tribunal, giving an opinion in part as follows:

"The kicking propensity of a mule is a matter of common knowledge and has been the subject of comment from earliest times. . . . The quality of the plaintiff's action cannot be the subject of dispute. All reasonable men will agree that he showed utter disregard of his own safety. . . . The mule requires no particular setting for the exercise of his high prerogative. He is liable to kick at any time and no one can plead ignorance of his tendency. . . . It is a case where the plaintiff not only invited disaster, but actually provoked it. He made himself a convenient target by stooping down and placing himself near the mule's heels. Not being satisfied with this invitation he actually applied the lash. . . . Here the mule would have been untrue to himself and false to every tradition of his breed if he had passively acquiesced in such treatment and kept his heels on the ground."

Not Coke But Smokeless Fuel

All the discussion regarding saving of byproducts has been based on the idea that they are to be saved in the production of coke. As a matter of fact there is an insistent call for something to assist anthracite in its work of providing smokeless fuel. Perhaps coke is the substance foreshadowed by that call, but that is by no means certain.

At the price at which anthracite is sold it is impossible to provide a substitute unless there is a side profit in its production, such as the securing of byproducts. Gas coke has been sold for that purpose because the gas secured makes the sale profitable at low prices. But the Connellsville people have long desired in vain to enter into the domestic markets with their product. They do not produce their coke at a figure that makes it attractive to the metropolitan consumer.

Now it is possible to produce a fuel which burns readily and does not smoke and at the same time to extract in the making of the fuel large quantities of material which will make fertilizer, dyestuffs, lubricating and power oil, drugs, explosives, good roads and rainproof roofs. The sale for metallurgical coke may be limited, but the call for near or low-temperature coke at a low figure is as wide as the domestic and steam-producing market. A fuel which burns freely and does not coke in so doing, which makes no smoke and does not fall through the grates, is essentially desirable, especially if sold at a low price.

Engineering, of London, assures us that from 1 ton of coal we can get 26.8 lb. of sulphate of ammonia, 0.33 gal. of benzol, 0.44 gal. of toluol, 0.11 gal. of xylol, 0.34 gal. of solvent naphtha, 0.87 gal. of heavy naphtha, 0.26 gal. of carbolic acid, 2.72 gal. of cresylic acid, 2.46 gal. of creosote, 0.96 gal. of lubricating oil, 1.02 gal. of Diesel-engine oil and 90 lb. of pitch. In addition, the rich gas produced can be washed and 3.21 gal. of benzol, 0.54 gal. of toluol and 0.11 gal. of xylol obtained.

Several British firms are already manufacturing or preparing to manufacture this near-coke. It may be better suited to their needs than to ours, for the British largely use open grates. We cannot always take their business practice as a model for our own, for there is

an essential difference between their customs and ours. Nevertheless, the matter is worthy of consideration.

In any event it is sincerely to be hoped that the by-products of the consumption of coal will serve some useful purpose and not be principally used in coating our lungs, spoiling our health, befouling our buildings and besmirching our clothes. Whether we improve our methods of combustion or burn coke or near-coke it is to be hoped that a cleanlier and more sanitary life will be secured us.

The growth of the byproduct industries of all kinds assures city dwellers that though the sun now promises to be gradually blotted out by the growing use of bituminous fuel it will nevertheless be allowed to exercise its functions in the future as in the past despite all discouraging indications.

Merely a Verbal Quibble

The operators in the anthracite region have for many years objected to the fact that the United Mine Workers of America is an organization of labor covering not only the anthracite but also the bituminous field, which is its rival. The objection that in dealing with the union the operators were binding themselves to a body having its main strength in a competitive coal region at no time had any validity, though it was at all times quite a natural point of view.

The argument would have been far more forcible had it been said that the union covered not only the Schuylkill but also the rival Wyoming field, which always has the larger vote, and therefore the former region would not sign a contract with it. But this stand, though more logical, was never taken. It is needless to show that the Wyoming and Schuylkill fields, which ship to precisely the same markets, are competitors in a far more real sense than the anthracite and bituminous regions.

Though the argument for the segregation of the fields on moral grounds was unconvincing, the operators in arranging for the formularies for the signing of the recent agreement kept strictly in view the contention that the contract should be with the anthracite mine workers and not with the whole body of workers in coal mines.

To this end they have created a phantom Anthracite Mine Workers Organization with three districts, mysteriously numbered 1, 7 and 9, and three presidents directing their destinies. The presidents of this mysterious body have signed the contract as ordered by the miners. And lastly John P. White has signed it as "President of the United Mine Workers of America representing the Anthracite Mine Workers Organization."

Now all this quibble about a name may save the face of the operators, who said they would never give recognition to the union, but every one knows the recognition is given, nevertheless. There is no one who condemns them for facing about in their pledged word. Not only the casuist, but the public generally, is willing to absolve a man from the sin of breaking a promise which he had no right to make and which no one wants him to keep.

No one will be surprised that the operators would like a smaller degree of solidarity in the coal-mining industry. A strike embracing the whole anthracite region would be an utter failure if financed wholly by the union funds in that region and by the savings of the workmen. The strength of the union must come from the contributions of those elsewhere who at that moment are not striking.

Though the bituminous and anthracite mine workers are rivals for some of the same trade, it is hardly likely that either group will try to close down the mines of the other for its own advantage or will try to raise wages for that same end. It is conceivable, of course, but entirely unlikely. The anthracite men will make their demands and the bituminous men will back them, and vice versa, but not with the ulterior intent of destroying a competitive industry.

However, no matter what harm recognition may or may not do there is little purpose in disguising the fact that recognition is granted, and the reservations which the contract exhibits are probably made so that the union may note that there is still another bite in the cherry. This further morsel at the end of four years they will, it is hoped, seize with avidity, and hence will not hanker after forbidden fruits like the closed shop and the checkoff, of which both public and operators disapprove.

Market Outlook in New England

While contract demand at down East points has fallen off notably in the last fortnight, it is due as much to the shortage of marine transportation as any disinclination on the part of buyers to take on coal. Stocks are not heavy and most New England plants have thriving business prospects for a long time ahead. It is more a constitutional attitude of "wait and see" than any well-grounded belief that prices will be lower. Textile mills in this territory have granted large advances to operatives, and this, together with increased fuel cost, puts a heavy burden on the manufacturer. As long as the output can be sold at a profit, as in these times, it is likely that the mills will keep on running and pay the price for coal.

The settlement of the anthracite dispute in Pennsylvania has allayed a good deal of the anxiety that was felt in this section, and for several months at least the trade will probably settle into a rut.

If the situation were not so largely dependent on water-borne coal it would be easy to make a forecast of summer prices. It is known that quite a volume of fuel is yet to be purchased, but buyers are not sure which is the best thing to do—to turn to the railroads for delivery all-rail or to rely on a sufficient supply of boats to see them through. In neither direction is there much encouragement for this season.

The Retailer Labor Problem Solved with Motors

So much attention is devoted to the labor difficulties of the operating companies that some of the other departments are prone to be overlooked. The problem is also beginning to cause the retail dealers more concern than it has for years. They are finding it almost impossible to retain first-class help at the usual wages. Dependable drivers are becoming scarcer and more indifferent each week. As spring approaches, and outside work opens up with offers of increased wages, the coal man despairs of avoiding an increase in his payroll. As a result more dealers than ever are adopting motor vehicles to meet the labor shortage and lower the delivery costs.

Department of Human Interest

Making a Coal Town Livable

By C. M. Young*

SYNOPSIS—At Jeddo, Penn., the G. B. Markle Co. has provided a club and casino for its official employees. The casino is not self-sustaining, but the company supports it, as it serves as a much-needed social center.

The efforts of employers to insure favorable living conditions for their employees must necessarily take forms dependent on the varying circumstances of the different industries concerned. In some cases the employees secure their own quarters and can find their own social environment independent of their employers, for they are on the premises of the company during the hours of employment only. This is true of most city industries, although in some cases employers have made efforts to reach the lives of their employees even under these somewhat difficult conditions.

Other industries are so conducted that the employer must provide a town in which the employees can live if a regular supply of labor is to be maintained. This condition is one which is common in the coal-mining industry because the deposits of minable coal are often too far from the cities and villages in which the miners could be housed. Consequently it is necessary for the operators to supply residences—in other words, to build and own towns. But this is only one part of the work required, for some social conveniences must also be provided.

A Scheme for Benefit of Mine Officials

Some years ago at Jeddo, Penn., the G. B. Markle Co. tried a plan having for its purpose the improvement of living conditions for all classes of its labor. Unfortunately it did not succeed, and though due perserverance was exercised the scheme had to be abandoned. So at present the effort is largely concentrated on making life more pleasant for the office force and the higher employees of the different collieries.

The coal town pure and simple, the town whose center and excuse for existence is a mine or colliery, is the very type of cheerlessness and monotony. All who can get away in the evening, go quickly, if there is any place where they can go. It is something of an accomplishment to keep people at home when there is a large town within a half-hour by trolley, and even more of a success to make the social life of the coal village so attractive that the people in the larger town will come to it, as at Jeddo.

The Jeddo scheme is not educational, but merely social in character. The plan centers round the Jeddo Casino. When A. B. Jessup, the general manager of the company, went to Jeddo some few years ago he found nothing in the way of a social center except a boarding house, and the people had nothing to do after work was done but sit on the porch and watch the sun set.

After a time a hall was built, and together with the old boarding house it forms what is known as the Jeddo Casino. The hall is an attractive structure measuring 30x60 ft., and finished outside with stucco. The interior forms a single large room, which is used for dances, musical events, band and orchestra practice, lectures, first-aid training, church, Sunday school, and in fact for any purpose for which it is suited. A good dancing floor was put in, and this is protected from injury by canvas. The building is heated by exhaust steam. The lighting is indirect, and there are ornamental colored bulbs for decorative purposes.

The hall has been connected to the boarding house by a concrete passageway about half underground. This

JEDDO BOARDING HOUSE WITH PERGOLA-SURMOUNTED PASSAGEWAY

was built so that those using the buildings could pass between them during inclement weather without getting wet or soiling their shoes. It is lighted by windows and electric lights. After this passage was constructed it seemed a pity to have so much room idle a large part of the time, so bowling alleys were installed. These have proved to be one of the most popular features of the whole scheme. A small fee is charged for the use of the alleys, but it is too small to be considered as a return on the investment, and its purpose is more to insure care of the equipment by giving the men a close sense of interest in the alleys. The same thing is true of the billiard and pool tables installed in the basement of the old boarding house, which has been enlarged and refinished to accommodate them.

In order to utilize the roof of this passage to the best advantage it was finished smooth and pillars were placed along the sides to support the cross-timbers of a pergola. Thus its appearance has been changed so that instead of a somewhat unsightly passageway it is now a pleasant promenade lined on either side with seats.

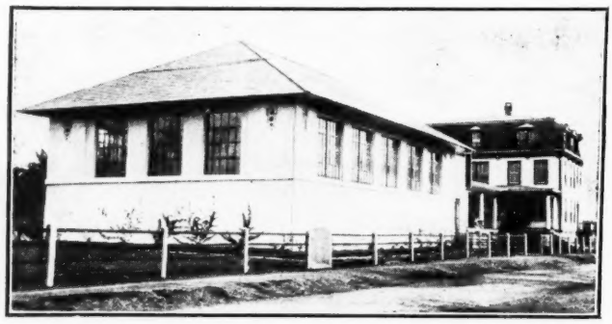
The old boarding house has been remodeled to some extent. The front rooms are used as parlor and reading rooms. In the latter there is a rack of the best technical and popular periodicals. Back of the reading room is

*University of Illinois, Urbana, Ill.

a game room provided with tables for cards and checkers, but no gambling is permitted. The dining room is not run by the company or by the association but is rented to a landlady at a figure which allows her to give good board at a low price and still make a fair profit. Smaller meetings than those for which the large room in the hall is needed are held in one of the upper rooms. One room is given up entirely to the Boy Scouts and another to the Camp-Fire Girls. Other rooms are occupied as living quarters by various employees.

The casino is used principally by the Jeddo Social and Athletic Association. This is a body formed from among the employees of the company for mutual pleasure and improvement—really to make life as bearable as possible in a small town where the opportunities for relaxation and amusement are limited.

Before the association was organized, various plans for operating the casino were considered. The employees might be given the use of it without charge and the company might control the management, or might leave it wholly in the hands of its employees. But finally



CASINO HALL, WHERE OFFICIALS HAVE THEIR CLUB

it was decided that a small charge would be made and that the control should be kept by the company.

It was thought certain that the men would appreciate the use of the equipment more if they had to pay something for using it. The casino and its contents belong to the company, and approval must be secured for everything done there. It is hoped that several social organizations will use the casino, but at present only one such social body has been formed. In all probability no other will be needed, but the way is kept open for another body should the present association become too exclusive or in any way undesirable.

The association pays a small rental for the use of the casino, but not enough to pay for janitor service and heat, so the company carries the investment and provides for the upkeep. On the whole, the experiment costs the company between one and two thousand dollars a year, and as a sort of heaping of the measure the company gave a series of entertainments last winter, provided by one of the good lyceum bureaus. These were free to members of the association and to invited guests.

Membership in the organization is limited to employees of the G. B. Markle Co. and their families. Persons desiring to become members make application to the association. This application must first be signed by a certain number of members and then submitted to the proper representative of the company. If he approves the application it is acted upon by the members. The membership is not limited either as to numbers or as to classification in the service of the company. It is generally understood that the membership is restricted to the office force—foremen, assistant foremen, firebosses, etc.; but there is no reason why any other man working at the mines should not become a member if he is otherwise desirable.

One of the best things about the whole scheme is that the women are members. There is nothing more depressing for a woman than the gray monotony of a coal town, and there is none of that here. There are dances, musical entertainments and lectures. And when some woman wishes to entertain her friends on a scale larger than her home permits, she rents the hall. It costs her $1 if she does not invite all members of the association, nothing if she does.

Up to the present, about one year from the opening of the casino, the plan has met with great success. The members of the association no longer go out of town to spend their evenings, but stay at home and get acquainted with each other in more than a business way and lead a life having common interests, which would be impossible if they separated as soon as the day's work was finished. It is a plan which ought to be followed in more coal towns.

Union Pacific's Mine-Rescue and Instruction Car

By Thomas Gibson*

The instruction car of the Union Pacific Coal Co. is a combination passenger and express coach, freshly painted, remodeled and especially equipped for mine-rescue purposes and for the training of men in first-aid work. It can be heated by steam or with a Baker heater. It is neatly and safely wired for electric lights and is arranged to use electricity having a voltage from 500 down. It is also fitted with oil lamps. In one end of the car is a modern kitchen, having water tanks overhead, and a sink, steel range, cupboards and other facilities handy. The living quarters and apparatus room are combined.

There are six berths, three on each side of the car. Under them are two comfortable coach seats. There are lockers for blankets, bedding, apparatus, first-aid material, flashlights, batteries, railway and marine fire extinguishers, potash cartridges, electric carbide, safety lamps, army field stretchers, lungmotor, mouth-breathing apparatus, half-hour self-rescuer breathing apparatus, and other necessary equipment for use in case of fire or accident. There is also a work bench for making repairs.

Few Fields Where Training Is So General

The illustration of the instruction car—which is produced from a photograph by Steve Traher, the assistant mine foreman of E mine, Superior, Wyo.—shows on the extreme right the First-Aid Club building at Superior.

G. W. Riggs, who is in charge of mine rescue car No. 5 of the United States Bureau of Mines, has been in the southern coal fields of Wyoming for the last six months training miners in first-aid methods and mine-rescue work. He is much pleased with his trip and has stated that he had trained more men in the southern fields

*Chairman of Bureau of Safety of Mines, Union Pacific Coal Co. and Superior Coal Co.

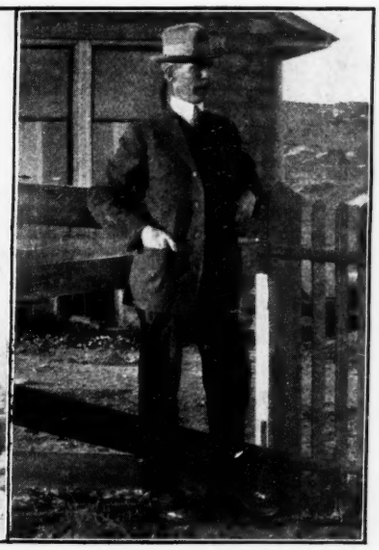
of Wyoming, in proportion to the number of men employed, than he had ever coached in any other coal field in the United States. Mr. Riggs has been employed by the Government at this work for the last seven years, and his statement therefore is made more forcible by the length of his experience.

The meetings held at the different mine villages were well attended and much interest and enthusiasm were shown. Every Friday evening was "Ladies' Night," so that all the women around the mines are now fairly well versed in mine-rescue and first-aid work. Business and professional men were present and a spirit of coöperation was established.

F. L. Davis, superintendent of the Superior Coal Company mines, at Superior, Wyo., carried off the first honors for first-aid training, having 71 men so trained. He had also 44 men trained in mine-rescue work with the breathing apparatus. D. G. Thomas, superintendent of the Rock Springs, Wyo., mines, had the largest number trained in mine-rescue work—49 men. He also had 43 who were competent first-aid men.

INSTRUCTION AND RESCUE CAR OF UNION PACIFIC COAL CO. WITH RESCUEMEN

Bottom row from left to right—Joe Adamik, M. McPhee, R. E. Vanlette, J. Moscow, M. L. Moscow, G. W. Riggs with the U. S. Bureau of Mines, Joseph Traher, mascot, and Thomas Gibson, Chairman Bureau of Safety. In the middle row from left to right—the Japanese Team: C. N. Sunada, Y. Ogasawara, T. Furushiro, I. Tashima, M. Sunada. In the top row from left to right—Andrew Brown, Harry Stokes, Allen Stokes, Egido Rizzonelli, John Barwick. First-Aid Clubhouse on right.



SUPERINTENDENT F. L. DAVIS

At whose mines the largest number of Union Pacific men received first-aid training. He also had a remarkable number of men practiced in the use of the oxygen-breathing apparatus.

Only Japanese Rescue Squad in United States

In the whole field there were 170 men who were trained by Mr. Riggs in mine-rescue work and 250 who received training in first aid. The Japanese first-aid and mine-rescue team at Superior, Wyo., is probably the only squad, composed solely of men of that nationality, to be found anywhere in the United States. They are all members of the United Mine Workers of America, District No. 22 of Wyoming.

The number of men trained in the first-aid and mine-rescue work in this field makes it certain that this noble work is here to stay. If the men working in and around the mines will only coöperate with the companies in doing their duty and will obey the rules and regulations and comply with the orders given by the mine foreman or his assistant, accidents can be reduced to a minimum, and there will be fewer women and children thus bereaved.

The first aid and safety movement is only in its childhood, but every man working in and around the mines should give it a hand and help it to grow. Boost for it. Throw away the hammer and get a horn.

The United States statistics have demonstrated that three-fourths of the deaths and serious injuries from accidents can be prevented. This is a serious question. Think it over.

News from Ohio Conferences

The conference between the miners and operators of the eastern Ohio field failed last week to arrive at an agreement on the wage scale. Several important points of difference developed, chief among which was the arbitration feature in the agreement of 1914, to which the miners are strongly opposed. After meeting almost continuously for 11 days the Cleveland meeting adjourned May 4, the conference deciding to meet during the present week at Wheeling, W. Va.

Operators claim that the differences dividing the two factions are vital, but the miners declare that the chances for an adjustment are good. Many of the operators believe it will be several weeks before the scale and working conditions will be entirely adjusted.

In the meantime most of the mines in the district are working. The small strike which occurred several weeks ago because of a dispute over the division of the 3c. increase is settled and most of the men have returned to work. The leading centers of discord were the Provident mine and mines Nos. 1 and 6 of the Rail & River Coal Co.

It is agreed that the loaders are to receive all the increase in scale granted, leaving the machinemen with the same rate that they were paid under the previous agreement. The machinemen will continue to receive 8c. for cutting the coal, while the loaders will be given 42c. for shooting it down and loading it. This adjustment settled the strike.

The working conditions in the Pomeroy Bend district were adjusted at a conference of operators and miners at Pomeroy. With the exception of a few changes, the agreement is practically the same as that formerly in force. The operators did not insist that the coal be "snubbed" before it is shot, nor did they demand the arbitration provision, which is deadlocking the eastern Ohio conference. Work will soon start in this district.

The agreement has also been signed in the Guernsey, the Tuscarawas and the Massillon fields. Conferences between the operators and miners in the Crooksville district are still in session. The Jackson field, which is holding its conferences at Wellston, has nearly settled its working conditions.

Discussion by Readers

Output per Man per Day

Letter No. 1—I have been much interested in the article by S. H. Ash, *Coal Age,* Apr. 29, p. 742, describing the method of working a pitching seam with a bad roof. We are told so frequently by mining men in Europe that the reason our output per man is the highest in the world is because our seams are level or nearly so and our roofs good. I think we might expand on the results obtained by the methods described by Mr. Ash and then endeavor to ascertain if Europe can show similar results under like conditions.

This seam is about 4 ft. 6 in. in thickness, and the longwall face pitches 38 deg. The face is 500 ft. long and is worked by 30 miners, who produce 250 short tons, or about 223 long tons, the output per man being 7.43 long tons per day. We now require to know the total number of company men and officials employed underground in the workings of that seam in order to ascertain the output per man per day for all employed. Of course, as more longwall face is opened out and the number of miners increased the output per man, for all employed, will increase. The cars hold about 2 tons of coal, but the gage of the track is not given.

I would suggest that these data be given and the question further discussed. Other readers could write valuable articles describing their methods of working thin seams and giving the output per man per day, the track gage, car capacity, etc. SAMUEL DEAN.

Delagua, Colo.

The Efficient Fireboss

Letter No. 2—I was glad to see a discussion started in respect to what constitutes an efficient fireboss. I read Letter No. 1, *Coal Age,* Apr. 29, p. 768, with much interest and can endorse what it said in regard to the mine foreman's having to go into the mine in the lonesome hours of the early morning.

In many respects the fireboss is much like a physician who is often called out during the night. With the same carefulness that the physician observes when he feels the pulse of a patient and examines his entire system, the efficient fireboss, safety lamp in hand, notes the throbs of the engine driving the fan, which is the heart of the mine forcing the air through the underground airways. I would liken the mine airways to the arteries of the human system. The main intake aircourse is the principal artery (aorta) from which branch the several air splits, in the same manner as the subclavian and brachial arteries branch and divide in the human body, while the butt entries and rooms correspond to the capillaries of the system.

The competent fireboss must have a thorough knowledge of mine gases and ventilation, the erection of brattices and trapdoors and must use good judgment in the hanging of canvas so that the current can sweep away accumulated gases. In addition to this, he must have a full knowledge of the mining laws of his state and live up to their requirements. With this knowledge he proceeds to examine every part of the mine with the same care as the physician examines and diagnoses a critical case. He notes the roof conditions and timbering and observes if sufficient air is passing and that the current sweeps the working face.

Weak Points in Inspection Work

While it cannot be denied that dangerous conditions can arise in a very short time in mine workings, I feel that a large number of accidents arising from explosions of gas are the result of neglect. These, however, are not always to be charged to the inefficiency of the fireboss, who may be honest, conscientious, reliable and competent to perform the work if he had it in his power to keep his district in proper condition. In this respect the fireboss has much the same difficulty to contend with as a mine inspector, who is supposed to examine carefully every mine in his district, but for lack of time may overlook a dangerous place and be the indirect cause of an accident by reason of this oversight.

I do not wish to be pessimistic, but the history of mining proves that all mine inspection and the work of firebosses have these weak points, and supposedly ideal mines thus may become the scenes of sudden and unexpected disaster.

In regard to the pay of firebosses, anyone familiar with mining knows that this position should command a good wage. While he is better paid in some states than in others, it often happens that his compensation is hardly equal to that of a mule driver, who has none of the fireboss' responsibility and requires far less knowledge to properly perform his work. It can be said with much truth that if firebosses were paid higher wages, better men would be secured in many cases and accidents would be less frequent.

It is readily admitted that all firebosses are not alike, as there are good and bad in every occupation; but an unreliable fireboss will often cause his superintendent much anxiety owing to the fear that the examination has not been properly made. The greatest danger, however, occurs when a mine foreman overrides the authority of a fireboss who has completed a careful examination of the mine and reported certain sections to be unfit for work.

Duty of the State Mining Department to Protect the Fireboss

I have referred to the difficulty a fireboss meets at times when he cannot secure the performance of the work necessary in his section to put it in proper and safe condition. It would seem that here the mining department should step in and see that the recommendations of the fireboss are carried out. In my opinion, every fireboss should be a competent miner who has had ten years' experience in mining coal and should hold a certificate of competency granted by an examining board after he

has passed an examination as to his knowledge of mining. As suggested in a previous discussion in *Coal Age,* I believe that the fireboss should act as assistant to the district mine inspector, under the jurisdiction of the State Mining Department. I believe the enactment of such a law would have a good effect in many coal-mining states.

In closing, I want to say that conditions are made all the harder by the demand for cheaper coal, and this feature affects all mine officials to a greater or less extent, as they must work under conditions below the normal, making their duties burdensome and decreasing their efficiency. A FIREBOSS.

——, Ohio.

Letter No. 3—Besides being a man of temperate habits, conscientious and possessing a full knowledge of the mining laws and the general rules laid down by the company, together with a thorough knowledge of mine gases and the safety lamp, a fireboss should be a practical mining man and able to judge well the varying roof conditions so that he will know at a glance when a place is timbered properly and according to the system adopted in the mine.

In making his morning examination of the mine before the men enter, he must observe the ventilation and the roof conditions in every working place and know that the place is free from gas and safe for men to work. Again, when making his rounds during the day while the men are at work, an efficient fireboss will note all material thrown aside and that can be recovered. This is especially important in pillar work, where props, ties and rails are often covered up and lost.

AN EFFICIENT FIREBOSS WILL WATCH ALL MATERIAL SENT INTO THE MINE

It is an old and a true saying, "Take care of the pennies and the dollars will take care of themselves." I have known firebosses to remark, "Let it go to h——! I have nothing to gain by looking after that; it all goes to the big fellow." It is easy to see that such an idea is wrong. The fireboss who saves waste material about the mine is lowering the cost of coal. He may not think that it helps him directly, but inquiry often shows that advancement is due to such efficient work of firebosses and assistant foremen who are exerting themselves to care for all material sent into the mine.

In my opinion, the fireboss is the most responsible person in a gaseous mine. The life of every man in the mine depends on his ability and the care and thoroughness with which he performs his duties. As stated by the writer of Letter No. 1, there are too many firebosses who are ready to take the job just to have the name of being a fireboss. Some whom I have seen did not know how to put their lamp together. For this reason a superintendent should be careful when he employs a fireboss to ascertain what the man knows and whether he can be depended on to perform his work properly.

A fireboss should never be given a larger district than he can examine carefully in the time allotted him for making the morning inspection. When the district is too great, a portion of the work will be neglected. The first consideration of an efficient fireboss is the protection of the health and safety of the men in his district. Where the mine foreman is efficient, his firebosses will generally be found equally so and will require no watching. But where the foreman is negligent in his duties, it will frequently happen that the firebosses under him follow his example and require much watching. JOHN BUGGY.

Chambersville, Penn.

Drilling and Shooting Coal

Letter No. 6—One of the most important points in connection with this subject is the placing of the hole and charging the same after it is drilled. Where the mining laws of the state do not require that shotfirers shall charge and fire all shots, it often happens that inexperienced and reckless miners drill their holes at any angle with the face, practically ignoring the line of least resistance of the charge. This is especially dangerous where shooting off the solid is permitted.

Where coal is shot off the solid, each shot should be so placed as to open up the face for the succeeding shots. This requires the exercise of much care and judgment on the part of the miner. Advantage must be taken of any slips or cleats present in the seam, in order that each shot shall break the coal to the best advantage and give succeeding shots the best possible chance. Dependent shots, or those in which the work of one shot depends upon that expected to be performed by a preceding shot, should be prohibited by law in all coal-mining states.

There is probably no feature in the work of blasting coal in mines that is so frequently the direct cause of windy and blownout shots occurring with disastrous results as this dangerous practice of firing dependent shots. For this reason it should be wholly abolished.

All shots should be well balanced; that is to say, the heel and toe of the shot should be proportioned to the length of the drill hole. Holes should never be drilled into the solid or beyond the mining or cutting. This is regulated in some mines by a rule limiting the length of the coal auger to at least ½ ft. less than the depth of the undercut. Where the coal is cut by machines or shot off the solid, no hole should be drilled beyond the loose end or "chance," as the miner says.

FIRING DYNAMITE WITH BLACK POWDER IN ONE HOLE

The use of two classes of explosives in the same hole should never be permitted. A too frequent practice in blasting coal in headings or entries, in some localities, is to place a small bit of dynamite at the back of the hole, before charging the cartridges of black powder. The latter are then pushed into the hole on top of the dynamite. Whether the purpose of the dynamite is to cut into the solid, and thus give the miner a soft place to start his next cutting, or to assist the powder to break the toe of the shot, it is a bad practice that has frequently been the cause of fires, dust and gas explosions.

As is well known, there is a great difference between the rate of detonation of dynamite and the rate of burning of black powder. Dynamite will explode or detonate about ten times as fast as black powder burns. As a consequence, the dynamite at the back of the hole explodes before the black powder is well ignited, and the burning powder is very apt to be blown out of the hole and its force expended on the air, thus causing a windy shot and

igniting any gas or dust that may be present and possibly causing a disastrous explosion.

It sometimes happens that drillholes run out of line by reason of striking sulphur balls or spars, or the hole may become too small in diameter because the auger is allowed to get dull or the bit worn so that it is less than the proper gage. As a result, the powder cartridges may stick when being inserted in the hole and cannot be pushed back to their proper place. In such cases, some miners will take a chance and tamp and fire the hole with only one-half or one-third of the required amount of tamping. This is a very dangerous act, as invariably when the shot is fired it blows the tamping and much flame issues from the mouth of the hole, causing what is termed a "blownout" shot. When a cartridge sticks before reaching the point of the hole, no attempt should be made to fire that hole, unless the cartridge can be withdrawn and the hole reamed out so as to enable the charge to be pushed to the back of the hole. Great care is needed in withdrawing a cartridge, and before the hole is reamed out it should be thoroughly watered so as to prevent the ignition of any stray powder that may have fallen from the cartridge while in the hole.

Every drillhole should be properly tamped with earth, fireclay or other incombustible material, and the depth of the stemming or tamping should be at least one-half or two-thirds the length of the hole, depending on the work to be performed as determined by the weight of charge, shooting character of the coal, depth of hole, thickness of the seam, line of least resistance, etc. Where windy shots occur under conditions that make solid shooting practicable it is thought that they may result from too little stemming whereby fine coal dust is ignited by an outburst of flame when the shot is fired.

The Use of Squibs and Fuse for Firing Shots

Where squibs are used it is necessary to tamp the hole firmly to its mouth, in order to make sure that the squibs will reach the powder. Indeed, some inspectors have insisted on the use of squibs, knowing that this will compel miners to tamp their holes more thoroughly than when permitted to use fuse. Two kinds of squibs should never be used in the same place, for the reason that there is often a large difference in their rate of burning, and this may lead the miner to return to the face before the second shot has exploded. The miner should never tamper with a squib or shorten the match by biting or breaking off the end, or put oil on the squib to hasten its burning. These are bad practices that frequently cause premature blasts.

Where fuse is used in firing shots, care must be exercised in securing the end of the fuse to the primer. It is well to cut off about one inch from the end of the fuse, which may have become damp by exposure. When the end has been inserted in the primer, it should be made fast by tying the primer securely about the fuse. Kinks should be carefully avoided in the fuse as the latter is inserted in the hole, and any hard bits of rock that may cut or injure the fuse should be carefully eliminated from the tamping. Too often a miner is tempted to use a short piece of fuse, say 1 or 2 ft. long, in order to save both time and expense, or to hasten the explosion of the powder when shooting a wet hole. This is a bad practice. The fuse should extend at least 2 or 3 in. beyond the mouth of the hole so as to permit the latter to be tamped to its mouth and avoid any danger of igniting gas in the drillhole.

In my opinion, electric firing is by far the best and safest system to adopt, both for the miner and the company. Electric firing eliminates the many chances of accidents that are present in the use of either fuse or squibs. Where a proper system is adopted, there is no danger of a premature blast occurring in electric firing. In my opinion, this system of firing should be adopted in all mines.

In closing I wish to advocate both the handling of explosives and the charging and firing of shots by certified shotfirers who have been carefully selected and trained for this work. It is self-evident that a man trained solely for such work can produce a maximum amount of salable coal and perform the task more efficiently and safely than when it is done by miners as a class. Besides the experience and skill gained in the daily performance of the same duties, a conscientious shotfirer will constantly strive to increase the amount of marketable coal with the least expenditure of powder and the maximum measure of safety. My idea is that the shotfirer should supervise the handling of all explosives from the time they leave the magazine until the shots are fired in the mine.

J. W. Powell, Mine Foreman,
Madrid, N. M. Albuquerque & Cerillos Coal Co.

Locating a Booster Fan

Letter No. 5—I notice that the question of locating a booster fan in a mine has received some attention recently in *Coal Age,* and that W. A. Rowe has apparently solved the question from a technical standpoint.

When two fans are working on the same air current, they must be either placed side by side or they must be arranged tandem to each other. The action of the two fans in either case appeals to me, in a practical way, as being similar to two men loading a wagon of coal. If B shovels the coal to A and A shovels it into the wagon, the time taken to load the wagon will depend on the speed with which A handles the coal. This is similar to the tandem arrangement of two fans where the first fan supplies air to the second fan, the two fans thus working in series.

Now, if the two fans are placed side by side the arrangement would be the same as if the two men A and B, just mentioned, each shoveled their coal into the wagon. The wagon would then be loaded in half the time that it took when A shoveled into the wagon the coal supplied to him by B. In the same manner, two fans working side by side would produce double the quantity of air circulated by one fan handling the air delivered to it by another fan in series.

In regard to the best location for a booster fan, it seems to me that the main fan supplies the air in the mine, say 30,000 cu.ft. per min. Assuming that one section of the mine has insufficient air for its proper ventilation, the circulation in that section could be increased by placing a regulator at one of the splits taking more air than needed. However, this would increase the resistance of the mine and the main fan would then supply only, say 25,000 cu.ft. per min.

In order to avoid this drop in the total circulation, however, the method is often adopted of placing a

booster fan at some convenient point in the section where the ventilation is defective. By this means the air in that section is given a fresh impetus and the ventilation improved without throwing any extra work on the main fan, which continues to supply the required quantity of air in the mine, as before.

Adamsburg, Penn. NELS G. BOLLING.

The Miner and Safety First

Letter No. 10—It is time that the miner put into practice his talk of "safety first." He should feel that it is a duty he owes to himself and family to assist in every way possible to make work in the mine safe. He should work hand in hand with the mine foreman. If all miners would coöperate in this way there would be fewer accidents, but miners forget and grow careless in their work.

Only today a driver barely escaped severe injury when the mule he was driving caught his foot in a switch that was left unprotected. The mule's hoof was torn off and the driver had a bad squeeze, but luck was in his favor. The driver should have noticed before that the switch was not properly protected and reported the fact, as well as taking more care when passing that place.

Much depends, also, on the foreman, who should work hand in hand with his men in making the mine safe. He should encourage men in their efforts and give them credit when they do good work. I have worked for foremen who rushed the work so much that little attention was given to the safety of the men, who were expected to look out for themselves, but I am glad to say that most foremen today are studying safer methods and doing what they can to avoid accidents.

——, Ind. A MINER.

Inefficiency of Mine Foremen

Letter No. 1—I have followed with the greatest interest the numerous letters written in regard to what constitutes an efficient mine foreman, and it seems to me that, to make this discussion complete, it will be well to consider what characteristics make a mine foreman inefficient.

Being myself a mine foreman, I am going to ask the privilege of naming six reasons for the inefficiency of men holding this office. They are things to be avoided as the mariner avoids the rocky shoals marked on his chart and seeks the open channel. They are danger points in the career of every mine foreman. The reasons follow:

1. The indulgence of the drink habit by a mine foreman, especially when in the company of the men in his employ, not only undermines his influence with the men but dulls his mind and causes him to neglect the work in his charge. When under the influence of liquor, a mine foreman will often make admissions or promises that serve to tie his hands and make it impossible for him to enforce the discipline that is required in the mine.

2. The habit is common among many mine foremen of having "confidential men," who would be better styled "tale bearers." A good foreman, however, will keep his own counsel and be guided by his own judgment. He should act on his own personal knowledge of affairs, derived from his own observation or the reports of trusted assistants. Often stories passed from mouth to mouth are repeated with compound interest to the mine foreman. These confidential advisers quickly become known to the men, with the result that the foreman loses the prestige or standing that he should maintain among his men.

3. It frequently happens that a mine foreman is stubborn and persistently refuses to listen to suggestions of a superintendent or manager who tries to assist him in the performance of his duties. Such a foreman reasons to himself, "I am paid for running this mine, and I am going to do it in my own way." While there are circumstances and conditions that would warrant a foreman in assuming such an attitude, it is certain that it can be carried too far and often proves the inefficiency of the foreman. He should stand ready to adopt a good suggestion and, at least, give it a fair trial, unless his better judgment tells him it is impracticable.

4. One evidence of inefficiency in a mine foreman is the attempt often made to run the mine from the outside, depending on the reports of his assistants in regard to the work needed and the work done underground. In doing this, a mine foreman is guilty of violating one of the chief requirements of the bituminous mine law, which states that he must devote the whole of his time to his duties in the mine when the mine is in operation and keep a careful watch over the ventilating apparatus, the ventilation, airways, travelingways, timbering and drainage of the mine, and see that all stoppings along the airways are properly built, etc., The law further provides that when mine workings become so extensive that the mine foreman is unable personally to carry out the requirements of the law pertaining to his duties, he shall have the right to employ a sufficient number of competent persons to act as his assistants under his instructions.

5. Another point of inefficiency on the part of a foreman is the failure to put confidence in his regularly appointed assistants, or refusing or failing to give them due credit for work done in keeping their several sections of the mine in proper condition. Such attitude of a mine foreman at once disheartens an assistant and causes him to neglect many things that would be to the foreman's interest if given proper attention. The confidence of a foreman in the work of his assistants acts always as an incentive to greater endeavor on their part.

6. Failure to keep the necessary material on hand and ready for use shows, again, inefficiency on the part of the foreman. Where the necessary supplies are not on hand when needed the work is delayed and the output reduced, while the running expenses and cost of production per ton of coal mined are much increased. As a result, the foreman in charge gets the reputation of being inefficient, although it may frequently happen that he is not to blame as much as those higher in authority, or a clerk or storekeeper who has failed to secure prompt delivery of the material ordered. It generally happens, however, that the foreman is blamed for all delays arising from this cause. When a foreman is obliged to work under these conditions he will often find it difficult to rid himself of the injustice done him and to show that the fault was not his own. Being myself a new man just starting in the business, I would be glad to hear from older men on some of these points.

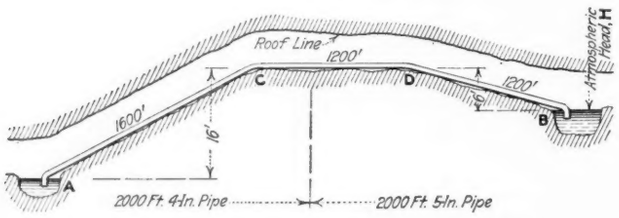
Madera, Penn. SAMUEL JONES.

Inquiries of General Interest

Siphon Line in a Mine

Kindly answer the following question in *Coal Age*, giving the best possible information in regard to the working of a siphon line under the conditions I describe:

There is a lodge of water in our mine 4,000 ft. from the shaft bottom, with which it is connected by a pipe line having the following dimensions: Starting from the sump *A* in the shaft, as shown in the accompanying drawing, the first 2,000 ft. is 4-in. pipe, while the remaining 2,000 ft. is 5-in. pipe. The level of the water in the lodge *B* is 10 ft. above that in the shaft sump at *A*. The profile of the pipe line is as follows: Starting from the shaft, the line rises 16 ft. in 1,600 to *C*, the road having a 1 per cent. grade. From this point it runs level



PROFILE OF A SIPHON LINE IN A MINE

for 1,200 ft. to *D* and then drops 6 ft. in the remaining 1,200 ft. to the lodge *B*, this portion of the road having a grade of ½ per cent.

I would like to ask if the siphon will work under these conditions, and what quantity of water will be discharged at the shaft. I would also like the readers of *Coal Age* who have practical experience with mine siphons to give their opinion on this question or offer any suggestions they may see fit.

JOHN BEDNAR, Assistant Mine Manager,
Southern Coal, Coke and Mining Co.
New Baden, Ill.

In the calculation of a siphon there are always two operations: (1) The quantity of water that will flow from the upper to the lower basin under the effective head, which is the difference in the elevation of the water in the two basins, is calculated on the basis that the effective head is equal to the sum of the friction head and the velocity head, for each section of the pipe. (2) It is then necessary to calculate what quantity of water will flow per minute from the upper basin to the crown or highest point of the siphon, under the atmospheric head (34 ft. at sea level).

If this calculation shows that the flow in the suction end of the pipe line is equal to or greater than that in the discharge end, the siphon will work properly as long as both ends of the pipe are submerged and the supply of water in the upper basin is maintained, provided the joints of the pipe are air-tight and the flow of the water in the siphon is not obstructed by the accumulation of air escaping from the water at the crown. If, however, the flow of water per minute in the suction end, under atmospheric pressure, is less than that in the discharge end, under the effective head, the siphon will tend to empty itself and will run but a short time.

In making these calculations, whenever the diameter of the pipe in inches does not exceed its length in hundreds of feet, the velocity head can be ignored with slight error, not exceeding 1 per cent. This is the case in both sections of the pipe line here considered, and it is therefore necessary to consider only the friction head for each section of the pipe, as given by the expression $lG^2/800d^5$. The effective head in this siphon is $16 - 6 = 10$ ft. Equating this effective head with the sum of the friction heads in the two sections of the pipe line, we have

$$(16 - 6) = \frac{G^2}{800}\left(\frac{2{,}000}{4^5} + \frac{2{,}000}{5^5}\right)$$

Then, solving this equation, with respect to G, we find, for the flow of water in this siphon,

$$G = \sqrt{\frac{800\,(4 \times 5)^5\,(16 - 6)}{2{,}000\,(4^5) + 2{,}000\,(5^5)}} = 55.5\ gal.\ per\ min.$$

To ascertain if this flow will be continuous, it is now necessary to calculate the flow in the suction end of the pipe line, from the upper basin to the crown of the siphon, under atmospheric pressure. Here the effective head expressed in water column at sea level is $34 - 6 = 28$ ft. This flow delivered at the point *C*, in the drawing, must be at least equal to the flow just calculated for the entire length of the siphon line, in order that the operation shall be continuous. In this calculation two sections of pipe must be considered—namely, 2,000 ft. of 5-in. pipe and 400 ft. of 4-in. pipe. The flow in this case is

$$G = \sqrt{\frac{800\,(4 \times 5)^5\,(34 - 6)}{2{,}000\,(4^5) + 400\,(5^5)}} = 147.4\ gal.\ per\ min.$$

The flow in this siphon will therefore be continuous, since the suction flow under atmospheric head is found far to exceed the flow in the discharge end under the effective gravity head. Had the 4-in. pipe been used throughout the length of this siphon, the flow would have been reduced to 45.25 gal. per min., while if the 5-in. pipe had been used throughout the entire length the flow would have been increased to 79 gal. per min.

To Stop Heavy Flow of Water in a Borehole

Kindly permit me to submit to the readers of *Coal Age* a practical question that confronted us last week and which gave us no little trouble and anxiety for a while, but which was finally solved and the difficulty overcome successfully after trying four different ways. The problem was how to stop a heavy flow of water, 70 ft. below the surface, in a 6-in. borehole 378 ft. deep and prevent it from reaching the mine. Later, I will explain the plan that proved successful.

J. H.

Examination Questions

Mine Managers' Examination, Springfield, Ill., Jan. 10, 1916

(Selected Questions)

Ques.—Suppose you have a sump 12 ft. in diameter and 25 ft. deep, full to the top with water. The inflow of water is at the rate of 20 gal. per min. How long will it take a pump with a 7-in. water-end and 14-in. stroke, making 75 double strokes per min., to empty the sump, the efficiency of the pump being 72 per cent.?

Ans.—The capacity of this sump is $25\ (0.7854 \times 12^2) = 2{,}827.5$ cu.ft., or $2{,}827.5 \times 1{,}728 \div 231 = 21{,}150$ gal. Assuming the water-end of the pump has an efficiency of 72 per cent., the capacity of the pump is

$$G = 0.72(0.7854 \times 7^2)\ 2 \times 75 \times 14 \div 231 = 251.9 \text{ gal. per min.}$$

Since the inflow of water into the sump is 20 gal. per min., the net discharge from the sump is $251.9 - 20 = 231.9$ gal. per min.

The time required to empty the sump, under these conditions, will then be $21{,}150 \div 231.9 = 91.2$ min., or 1 hr. 31.2 min.

Ques.—What is meant in geology by the "Carboniferous measures," and of what materials are these measures principally composed?

Ans.—The Carboniferous measures include those strata or formations lying above the Devonian and below the Triasic periods, in the geological scale, although the term is more generally applied to the formations lying between the Devonian and the Permian. The measures are so called because of the great coal beds they include. Besides the coal beds, they are composed chiefly of shales, limestones, clays, sandstones and conglomerates.

Ques.—What are the structural differences between "slate" and "clod"?

Ans.—A slate is a dense, fine-grained rock having a characteristic cleavage, often designated as a "slaty cleavage," while a clod is a mass resembling a soft shale or impure clay, having no cleavage or jointed structure of any kind.

Ques.—If a beam 5 ft. between the points of support bears a load of 6,000 lb. uniformly distributed along its length, what weight will a beam of the same material and dimensions, but 7 ft. 6 in. between the points of support, bear under like conditions?

Ans.—Other things being equal, the load supported by a beam varies inversely as the distance between the supports. In other words, the ratio of the loads supported is equal to the inverse ratio of the distances between supports. Thus, calling the required load x, we have

$$\frac{x}{6{,}000} = \frac{5}{7.5} = \frac{1}{1.5}$$

$$x = \frac{6{,}000}{1.5} = 4{,}000\ lb.$$

Ques.—If a water gage of 2 in. passes 15,000 cu.ft. of air per min., what water gage will pass 30,000 cu.ft. per min. in the same airway?

Ans.—For the same airway, the water gage varies as the square of the quantity of air in circulation. In other words, the water gage ratio is equal to the square of the quantity ratio. Then, calling the required water gage x,

$$\frac{x}{2} = \left(\frac{30{,}000}{15{,}000}\right)^2 = 2^2 = 4$$

$$x = 2 \times 4 = 8 \text{ in.}$$

Ques.—If 13 cu.ft. of air weighs 1 lb., how many tons of air pass through a mine in 8 hr. where the current is 52,000 cu.ft. per min.?

Ans.—The weight of air passing through the mine is $52{,}000 \div 13 = 4{,}000$ lb., or 2 tons per min. The weight of air passing in 8 hr. is therefore $8 \times 60 \times 2 = 960$ tons.

Ques.—What is the weight of 1 cu.yd. of coal, the specific gravity of which is 1.4?

Ans.—Since 27 cu.ft. equals 1 cu.yd., the required weight of a cubic yard of this coal is $27 \times 62.5 \times 1.4 = 2{,}362.5$ lb.

Ques.—How much water will a pump discharge with a water-end 10 in. in diameter, a 4-ft. stroke and making 48 strokes per min.?

Ans.—Assuming an efficiency of 85 per cent. for the water-end of this pump, the discharge is

$$G = 0.03468d^2S = 0.03468 \times 10^2 \times 4 \times 48 = 666 \text{ gal. per min.}$$

Ques.—What is meant, in the science of mine ventilation, by the term "equivalent orifice"?

Ans.—The term "equivalent orifice," as formerly used, referred to the ratio between the quantity of air in circulation and the square root of the water gage producing the circulation. Since this ratio is only constant for the same mine or airway, ventilated under the same conditions, it has no practical value and is no longer used. It compares the circulation of air through a mine or airway to the flow of a fluid through an orifice in a thin plate, the area of the opening in the plate representing the so-called equivalent orifice of the mine or airway.

Every mine or airway has a certain resisting power in respect to the circulation of air. This value is represented by the ratio of the sectional area of the airway or the area of passage in a mine to the cube root of the rubbing surface, for a constant power on the air. This ratio, which is called the "mine potential," has a definite value that is applicable to all conditions and which, multiplied by the cube root of the power on the air, shows the quantity of air circulated, by the given power in that mine or airway. For example, the power potential of a 6x10-ft. airway 2,000 ft. long is $X = a/\sqrt[3]{ks} = 6 \times 10/\sqrt[3]{0.00000002 \times 2\ (6 + 10)\ 2{,}000} = 552.6$. The circulation produced by 25 hp., effective on the air in this airway, is $552.6\ \sqrt[3]{25 \times 33{,}000} = 552.6 \times 93.8 = 51{,}800$ cu.ft. per min. The term "mine potential" or "potential" of an airway is used in the same sense as "potential energy"; it is a property of a mine or airway expressing its power to resist the circulation of air.

Book Reviews

Comprehensive Mine Catechism

"MINING" IN A NUTSHELL—By James Wardlaw, Sr. Pp. viii + 215, 5½x7¼ in. 1 ill. James Wardlaw, publisher, 631 Garfield Ave., Scottdale, Penn. Cloth boards, $2.25.

An interesting book written by a practical mining man with 50 yr. experience in coal mines, 25 yr. of which has been spent with the H. C. Frick Coke Co. The preface says that the intention of the writer is to describe as briefly as possible both the practical and the theoretical methods of meeting mining problems. The purpose was to write the answers to the questions in such a simple manner that they would be easily understood by mining men of only a limited education. These intentions are fully met in the pages which follow.

Mr. Wardlaw thinks simply, writes plainly and keeps to his point; he isn't tempted to branch into quadratics or to use "jaw-breaking" words, because his whole training has kept him close to the mine and its problems. As someone has said of a certain class of writing, his work "smells of the mine" and not of the study. Mr. Wardlaw surprises the reader by his brevity. Most of the practical mining men do not have that admirable quality.

There are two parts to the book—that written for those seeking a fireboss' certificate and that designed for those who would qualify for mine foreman. The method of instruction is by question and answer, there being 250 questions propounded and replied to within the covers of the book. It is interesting to note there are five or possibly more questions on first aid, a subject which has not found its place before in catechisms on mining.

The reviewer is surprised to find embodied in the letter press something he regards as a little kindly advice to himself and a threat to keep him in mind of it. Under "Safety First Even at Home," the author says: "Don't think you know it all; there are others who like to know something once in awhile. Don't forget to recommend this book to your friends." But in deference to the quality of the book and not from a shrinking sense of safety first, the reviewer commends this volume to those of his readers who want a simple, plain, brief dissertation of the duties of the mining man.

Detection of Steam Wastes

TEST METHODS FOR STEAM-POWER PLANTS: A Reference Book for the Use of Power-Station Engineers, Superintendents and Chemists—By Edward H. Tenney. Pp. xvi + 208 + 16 index; 85 ill. D. Van Nostrand Co., 25 Park Place, New York, publisher. Flexible leather. Price, $2.50 net.

The engineer, chemist or superintendent of a coal plant should always be able to test the efficiency of the various units so as to know just what possibilities of economy are being foregone and to make preparations to meet them. As the efficiency engineers say, we should be able to place an absolute figure on the various sources of our losses so that we can tell how much it is well to expend to wipe them out. In most plants, however, some important losses can be removed without any cost whatever.

The value of such work manifests itself most plainly when a plant is working at what has been generally regarded as its full capacity. Then it is that the operator or engineer begins to question whether with a little more economy and a little better management the present plant could be made to do the work without enlarging buildings, buying boilers or hiring more men. This book does not show the way, it is true. It gives, however, the means of detecting the losses which may be saved in a campaign to be instituted for a better use of equipment. Of course the information contained in this book is important also for those who are about to accept or reject equipment which is furnished under a guarantee.

The book contains chapters on the purchase and testing of coal, on investigations into the economy of combustion, on treating and testing water for boiler-feed purposes, on evaporative tests for capacity and efficiency, on methods of testing prime movers and on the testing of power-plant lubricants. There are 24 pages of tables.

The illustrations are without a single exception line cuts, apparently drawn by the same artist and placed in the book solely for the purpose of informing the reader, which, strange to say, is no longer the main purpose of illustrations. Like our political speeches, our illustrations are not so often to enlighten as to incite. The former are used to make us join a party and the latter to make us read or buy a book. Educational value is a secondary matter. This book pursues a business-like way from title page to index and avoids the faults indicated, not only in the illustrations but also in the text.

At Last Another Coke Book

COAL AND COKE. By Frederick H. Wagner, gas byproduct lecturer, Johns Hopkins University. Pp. xii + 418 + 13 index; 6x9¼ in.; 138 ill. McGraw-Hill Book Co., Inc., 239 West 39th St., New York. Cloth boards. Price, $4 net.

For the most part this book is a compilation from published records, but the collection has been made by a master hand and it appears to be well balanced. The information is not merely from English sources but from German also, and therefore covers the industry of coke making with completeness.

Why it bears its present misleading title it is indeed hard to determine. It was the duty of the reviewer recently to take exception to the broad title of a book on mine ventilation. There is just as much to mislead in the title of the present book, for coal is described only as a product after mining and nothing is said as to its mode of occurrence or extraction.

On the other hand, the making of coke is considered at length; hence the more correct title would be "The Manufacture of Coke, with Some Chapters on Coal." It is to be hoped that the misdescription will not prevent the sale of the book to those who are really interested in knowing about the practice and theory of coke manufacturing.

The first chapter contains preliminary information on the origin and classification of coals as introduction to what follows. Then are introduced some remarks on oxidation and spontaneous combustion. In this, nothing is said of the important investigations of J. Ivon Graham, the Tyndall research student of the Royal Society, England, and the chemist at the Doncaster Coal Owners' Research Laboratory. The last of his papers, as far as the reviewer can discover, was read on Jan. 23, 1915, and published in March of that same year, and it should surely not be neglected in a book under the date 1916. The first of Mr. Graham's papers appeared as early as 1913.

The third chapter is on coking and gas coals and the fourth on analyzing coal. In this latter section the most recent methods of analysis are recorded, though P. Linderland Teed's method of determining the moisture content as described in a paper before the Institution of Mining and Metallurgy in London, England, is overlooked ("Coal Age," Vol. 4, pp. 576 and 577). However, the best American methods are given in full, and perhaps Teed's refinements if followed by some chemists and avoided by others might introduce discrepant results into otherwise standard operations. As a matter of record, however, the attempt of Teed to get the moisture content without sequent oxidation should have been given notice.

Carbonization in retort benches, also combustion and the heat of settings, are discussed in Chapters VI and VII. In the three following chapters, flue gases, pyrometry and Euchéne's "Thermic Reactions" are treated. Then follow carbonization in ovens, both with and without recovery of byproducts, and a chapter on chamber ovens, another on low temperature carbonization, and yet another on power production with waste heat.

The last chapter is mysteriously termed "Coke," and it rounds up what has already been omitted, but principally refers to methods of mechanical handling of coal and coke. It is to be regretted that no reference is made to Sir Vivian B. Lewis' work in low-temperature carbonization, but fortunately this information is easily accessible to everyone.

It is a book which can be recommended to the professional man, and if he is interested in carbonizing of coal he will regard it as one of the best in his library, despite the omissions mentioned and the fact that the treatment of byproducts is not considered, for which latter "Coal-Gas Residuals," by the same author, may be consulted with advantage.

Coal and Coke News

Harrisburg, Penn.

Pennsylvania's total production of coal in 1915 is given as 246,797,774 net tons by James E. Roderick, State Chief of Mines, in his summary of the coal industry issued on May 6. The anthracite production was less, but the bituminous and coke production were greater than in the year before.

The official figures show the following tonnages: Anthracite, 1915, 89,377,706; 1914, 91,189,641. Bituminous, 1915, 157,420,068; 1914, 145,884,530. Coke, 1915, 22,012,949; 1914, 17,164,124.

In his summary, Chief Roderick says:

This year opened with most unfavorable conditions, but toward the middle of the summer the bituminous trade began to feel the effect of the foreign orders for war munitions that called into activity nearly all the available plants in the eastern part of the country. Any concern that was able to manufacture powder, shells, guns or other supplies needed by the foreign countries, was placed in operation and work was pushed with feverish activity. The demand for bituminous coal to supply the needs of the plants engaged in this newly developed trade became so urgent that part of the output was diverted from usual channels, and as a result, the anthracite trade was benefited by the demand that arose for the smaller sizes of coal. As the year progressed, the industry became still more active and the year terminated with both regions producing very heavily and with prices at abnormal figures.

Higher prices of coal are expected during the year 1916. They are at least hoped for most ardently by most of the bituminous operators who feel that an advance of from 5 to 25 cents a ton is absolutely necessary to keep them from loss. The two principal arguments for a higher price are, that all other articles consumed or used in any way by the public have advanced in price, and the further reason that the profits on bituminous coal have hitherto been entirely too small. The existence of some of the operators when the selling price is so little greater than the cost of production, is precarious, and it is the general opinion that a higher price must be received for the production of some of the less firmly entrenched and less favorably situated operators or they will be compelled to relinquish the business. Another element that enters into this question, is the steady advance in the cost of production, due to the deeper mines, the longer hauls and the higher cost of labor, all elements that affect materially the total cost of producing coal.

The introduction and enforcement of the Compensation Act of 1915 will no doubt place an additional burden on the coal operators. The reporting of accidents to the state authorities with the utmost dispatch after their occurrence will in some instances be somewhat difficult and expensive, and the fact that the insurance rates are to be based on the risks of the individual mines, instead of being made equal throughout the state, will make necessary the installation of expensive safety devices by most of the smaller operators to bring their mines up to the standard maintained by the larger operators.

Labor troubles of the year were of a minor character and confidence is expressed for a continuance of peaceful operation, although the renewal of the wage scale in both regions Apr. 1, may prove an occasion for disturbance. The bituminous miners are having a prosperous season at present and they are generally anxious to continue without a break in their earning power. In the anthracite regions conditions are more uncertain and more apprehension exists as to the future.

Can Consuls Bring Damage Suits?

The right of an Austria-Hungary consular agent to represent aliens residing in Austria in damage suits and issue warrants of attorney to lawyers here to bring cases in the courts and represent such plaintiffs at the trial, is the interesting question raised before the courts by the Lehigh Valley Coal Co.

The cases include five suits brought by widows and parents of victims of an explosion at the Prospect Colliery of the Lehigh Valley Coal Co., some 18 months ago, in which the Lehigh company is charged with negligence in claims of compensation. Assistant General Solicitor P. F. O'Neill, for the coal company, questioned the legality and sufficiency of the warrant of attorney given by the Austria-Hungarian consul, Paul Bukva, to Attorneys P. T. McCormick and Roger Dever, counsel of the United Mine Workers, to represent the plaintiffs.

General O'Neill, held in effect that the Austrian-Hungarian consul had no legal right to bring the suits without special power of attorney from the relatives of the accident victims, and that there is no law giving him, the right to appear for such aliens in damage suits.

Attorneys, arguing for the consular agent, held that the latter secured such special power of attorney in three cases, but that in the two other cases, the letters were lost, destroyed or delayed owing to the war and interruption of communications with Austria. They further held that the consul had the right to act for subjects of his country under existing treaties between the United States and Austria.

The question as to the scope of duties of consuls of foreign nations has been pending for several years, and although there have been some decisions establishing their rights in the settlement of estates and collecting money, the question of their right to enter suits on damage claims for injuries remains in doubt. The decision of the court will be handed down later.

An Accident Map

A map of Pennsylvania graphically showing the number of accidents coming under the workmen's compensation act which have occurred in the state since Jan. 1, has been designed by the compensation board.

For every accident, a pin with a large colored head has been stuck in the map. Different colors are used to denote the three classes of Pennsylvania industry, red for industrial work, black for coal mines, and yellow for public service industries.

Allegheny County, the home of the great Pittsburgh iron and steel mills, leads with 61 accidents in industrial work, as compared with only 43 in Philadelphia County. This record is only to Mar. 31. Luzerne County is adorned with 84 black pins, indicating an equal number of accidents in the largest-producing anthracite county, whereas Allegheny County has only 11 accidents in the mines.

The other counties having a comparatively large number of industrial accidents are: Northampton 18; Dauphin, 11; Chester, Lehigh and Cambria, 8 each; Montgomery and Berks, 7, and Fayette, 6. Those counties having a large number of accidents in the mines are: Indiana, 40; Schuylkill, 31; Lackawanna, 26; Fayette, 19; Carbon, 17; Westmoreland, 12, and Northumberland, 8.

Several counties have no accidents recorded before the referees. They are Bucks, Monroe, Bradford, Sullivan, Montour, Adams, Snyder, Potter, Clarion and Forest. Others have had none in one or more of the classes.

In all there have been 302 mining, 247 industrial and 81 public service accidents.

PENNSYLVANIA

Anthracite

Mahanoy City—Fire discovered in the fifth level in Gilberton Colliery, destroyed considerable timber, and is causing much uneasiness among the officials. A considerable fire fighting force is working to overcome the flames.

Wilkes-Barre—The large coal companies assembled their mine foremen and assistants during the past week to go over the new wage scale granted the mine workmen. The adoption of the present wage scale means considerable figuring for mine officials. The advance in wages begins with Apr. 1. The clerks in the offices are "burning the midnight oil" calculating the increase.

Weissport—The boiler house and machine shop at the Lehigh Coal and Navigation Co.'s boat yard was recently damaged by fire to the extent of $2,000.

Carbondale—After being idle for many years the breaker owned and formerly operated by the Finn Coal Co. on North Belmont St., is soon to resume operations. This breaker has been leased to the Tip Top Coal Co. which will run the coal mined from its opening on Canaan St. through it. The small breaker located at this mine is not large enough to prepare the present output, larger facilities and connection with the railroad being secured at the Finn breaker. This is now being put in shape and new machinery installed.

Ashland—Friction developing over the interpretation of the 8-hr. law, which went into effect at the Philadelphia & Reading Coal and Iron Co.'s collieries on May 1, led to a strike at the East colliery on May 2, throwing 3,500 men and boys out of work. Loaders, drivers and starters are directly involved and say the character of their work necessitates considerable preparation preliminary to the day's work and that no time is allowed for this. The colliery may remain idle to undergo repairs.

Plymouth—At sunrise on May 1, residents of the town were awakened by a rumbling noise and many arose to find a large portion of the wall enclosing the Kingston Coal Co., playgrounds, together with a few yards of the sidewalk had dropped into the old workings of the Gaylord Colliery. The affected portion is owned by the company and men were at once placed at work filling it in. The hole was quite deep and numerous loads of timber were dropped into the cavity as well as many wagonloads of ashes.

Tamaqua—On Wednesday May 3, 8,500 workers employed in the mines of the Lehigh Coal and Navigation Co., in the Panther Creek valley went on strike. Notices had been posted making the working time from 7.30 until 4 o'clock, a schedule which was objectionable to the men. Under the new wage agreement approved by the Miners Convention at Pottsville, Penn., on May 4, the miners working on contract will be required to stay in the mines a full 8-hr. day. The Lehigh Coal and Navigation Co., had put this rule into effect and the strike speedily followed. Other mines will put the same rule in effect about May 8, and many more walkouts can be expected. The new schedule of hours will mean many readjustments throughout the coal region and many petty uprisings are expected before the men become accustomed to the new order of things. The collieries are working an average of four days per week at present, and are finding this short time hard to fill out due to the scarcity of empty cars.

Safety signs of all descriptions have become much in evidence about the mines during the past few weeks. In some mines maps showing the means of exit, are posted in a handy place where they may be read by employees who are in doubt. These will prove valuable in showing the way of escape in case of accident.

Bituminous

Lilly—Owing to the embargo on coal freight and a lack of orders the plant of the Piper Coal Co. has been closed down. More than 200 miners are out of work. Other plants in the vicinity are working one and two days a week.

Randolph—The miners of the Randolph Coal Co. who were on strike for some time have returned to work. The miners and the company have reached an agreement by compromise.

Uniontown—Forty thousand miners and coke workers employed by the H. C. Frick Coke Co. a subsidiary of the United States Steel Corporation, were notified on May 6 of a wage increase of from 5 to 10 per cent. operative May 8. It was announced that independent coke operators will also advance the wages of their men.

Leisenring—The organization of the Frick Employees Fraternity was recently completed, and 60 new members admitted which with the 40 original members who met at Connellsville recently makes a total membership of 100. The objects of this organization are to promote safety and sociability through the coöperation of employer and employee.

Connellsville—The coke production for the last week in April amounted to 407,300 tons, which compared with the previous week shows a loss of 13,140 tons or 5.4 per cent. in furnace production, and 24,780 tons or 13.4 in merchant production, the total recession being 37,920 or 8.7 per cent. from the previous week.

MARYLAND

Baltimore—The tonnage of the Consolidation Coal Co. for the four months of 1916 which have ended, increased over 400,000 tons as compared with the corresponding period of 1915. The total tonnage for the four months was 3,600,000 tons as compared with 3,180,000 tons for the first four months of the previous year. This company has contracted its entire output for the next 12 mo., and shipments will be further increased when the Helen's Run mines start producing.

WEST VIRGINIA

Fairmont—Coal loaders employed by the Four States Coal and Coke Co. at Annabel, near here, walked out on May 1 as a result of differences regarding wages. The operation of the mines was consequently tied up, about 600 men being idle. A strike was ordered after the loaders failed in securing assent to their views.

Montgomery—The Rail and River Coal Co. late purchaser of the Mecca mines at Eagle, has installed considerable machinery and will use power from a central station.

Vulcan—The Vulcan Coal Co., Roger Martin, general manager, has opened two additional mines and installed a new retarding conveyor coaling station. The old power plant has been abandoned and power is now received from a central station. A large amount of new electrical equipment has been added.

Williamson—S. H. Goodloe, mining engineer, is prospecting the Lawson land at East Williamson for purposes of development.

War Eagle—The Norfolk and Western is now double-tracking its line between Warncliffe and War Eagle. When completed the line will be double-tracked throughout the West Virginia coal field.

Morgantown—A six weeks' course in mining to fit miners for positions of fireboss, foreman, and superintendent, will be given by the department of mines at the West Virginia University in Morgantown, June 19 to July 31. No tuition will be charged and the use of all the University Laboratories will be free.

Wendel—The strike of the miners of the Maryland Coal Co. has been settled and the men have gone back to work. All the company's mines have been idle and about 300 men have been affected. No disorder occurred; most of the men who were out were foreigners.

KENTUCKY

Whitesburg—Sub-station No. 206 of the Consolidation Coal Co., at Jenkins, Ky., was recently destroyed by fire at a loss of $1,800. It will be rebuilt at once.

Lexington—A meeting of the Hazard Coal Operators' Association was held here on May 4 at which the workmen's compensation law, which becomes effective on Aug. 1, and the 15-cent increases announced by Kentucky and West Virginia railroads were considered at length.

Central City—Side tracks on the Illinois Central and Louisville & Nashville railroads through this part of the western Kentucky field are being congested with coal cars held for orders. The Illinois Central has piled up thousands of tons of coal in an open field near this city and maintains a guard day and night.

OHIO

Columbus—Another meeting of the executive committee of the Southern Ohio Coal Exchange was held recently and plans for completing the organization were discussed. U. S. Morris, of Detroit, representing the Jackson field presided as chairman. A proposition has been made to consolidate the new organization with the Coal Operators' Compensation and Labor Bureau, which has headquarters in the Huntington Bank Building and of which John M. Roan is commissioner. But this proposition is not meeting with approval by many of the members of the Southern Ohio Coal Exchange. After the wage scale conferences are completed steps will be taken to form a stronger organization.

ILLINOIS

Belleville—Six hundred miners employed at the Nigger Hollow mine could not go to work one day recently because the drivers' paychecks were made out for $2.84 a day instead of $2.98 a day, which is what they claim they should receive under the new scale. They refused to work. The trouble was adjusted by the officials agreeing to make up the difference on the next pay day.

FOREIGN NEWS

Stockholm, Sweden—The Swedish company Iserfjorden-Belsund at its general meeting recently decided to begin the mining of coal on Spitzbergen on a considerable scale, and for this purpose to increase the present capital stock of the company now at 290,000 kroner to 2,000,000 kroner. It was stated at the meeting that the Spitzbergen coal deposits were practically inexhaustible, and that the fuel is of splendid quality. The preliminaries of the coal mining will begin this summer with a strong expedition.

PERSONALS

J. H. Shaw, who has been for several years general superintendent of the Western Coal and Mining Co., was recently elected a director of the company, to succeed Sam H. West.

Arthur H. Lewis, has resigned as engineer of the Lehigh Division of the Lehigh Valley Coal Co., after about 20 years service, and will become head of the engineering department of the G. B. Markle Co., at Jeddo.

William Cotter, of New York, has been elected president of the St. Louis & O'Fallon Ry., the coal road controlled by the Busch interests, and also president of the Manufacturers' Ry., in St. Louis, better known as the Busch line.

Joseph A. Smith who has been superintendent at the Gilchrist mine of the West Virginia-Pittsburgh Coal Co. for several years has been transferred to Collier, and Seth Stevens has been promoted to be superintendent of the Gilchrist mine.

Edward C. Taylor for eight years superintendent of the Salem and Huron mines of the Keystone Coal and Coke Co., of Pennsylvania, has resigned to become president and general manager of the Fire Creek Smokeless Fuel Co., of West Virginia.

C. E. Tobey, of Scranton, Penn., formerly general superintendent of the Delaware, Lackawanna and Western Coal Co. has been appointed superintendent of coal trestles and storage plants for the Lackawanna. Mr. Tobey's office is with the coal sales offices of the Lackawanna in the Scranton Life Building.

Thomas W. Dawson has been appointed chief engineer of the H. C. Frick Coke Co. to succeed the late John C. K. Miller deceased. Mr. Dawson has been a member of the engineering force of the Frick company for 12 years, beginning as transitman and advancing successively through the different ranks to that of chief assistant to Mr. Miller prior to his death in April.

John H. McMillan, for several years manager of Nos. 5 and 6 mines, Comox colliery, Vancouver Island, British Columbia, of the Canadian Collieries (Dunsmuir) Ltd., has resigned and has been appointed a district inspector of mines for the British Columbia Department of Mines. Before leaving Cumberland, for Prince Rupert, where will be his official headquarters, he was entertained at a dinner by employees of Nos. 5 and 6 mines and other district residents.

OBITUARY

George C. Potts, superintendent of the Coal Sales Department of the Philadelphia & Reading Coal and Iron Co. died recently at his home in Rochester, N. Y. Mr. Potts had been in poor health for some time. He was born in 1834 at Port Carbon, Penn., and had been engaged in the coal industry practically throughout his entire life. He is survived by a widow, two sons, and two daughters.

James J. Corrigan, inside foreman of the Lance No. 11 colliery of the Lehigh & Wilkes-Barre Coal Co., died recently from pneumonia. Mr. Corrigan was 55 years of age and is survived by his wife and six children. He received a severe shock at the time of the disaster on Feb. 8 when seven men were killed by a gas explosion, being nearby at the time and forming one of the rescuing party. From that time on his system was in a weakened condition and the cold which recently attacked him soon developed into pneumonia.

Enos M. Barton, chairman of the Board of Directors of the Western Electric Co. died recently at his southern home in Biloxi, Miss., at the age of 72 years. Mr. Barton was a native of Jefferson County, N. Y., and though practically his entire life took an active interest in things electrical. When the Western Electric Co. was formed in 1879, Mr. Barton became vice-president, continuing in that office until the death of the president, General Stager in 1887. He later became president, which position he occupied for 20 years. Since his retirement from the presidency of the company in 1908, he has been Chairman of the Board of Directors.

PUBLICATIONS RECEIVED

"Geology and Oil Prospects at Cuyama Valley, Calif.," by Walter A. English. Illustrated, 24 pp., 6x9 in.

"Eighth Annual Report of the Geological Survey Branch of New Zealand." Unillustrated, 50 pp., 8¼x13 in.

"Lead in 1914 (General Report)," by C. E. Siebenthal, U. S. Geological Survey. Illustrated; 28 pages; 6x9 in.

"Report of the Department of Mines of Pennsylvania, Part 1, Anthracite, 1914." Unillustrated; 89 pages; 6x9 in.

"Seventeenth Annual Report of the Mining Industry of Idaho for the Year 1915," by Robert N. Bell. Illustrated, 134 pp., 6x9 in.

"Gold and Silver in 1914 (General Report)," by H. D. McCaskey, U. S. Geological Survey. Unillustrated; 36 pages; 6x9 in.

"Mine Statement for 1915," by Honorable W. D. S. McDonald, Minister of Mines of New Zealand. Illustrated, 120 pages, 8x12½ in.

"Annual Report of the Mines for 1915." Department of Public Works and Mines, Province of Nova Scotia. Illustrated, 151 pp., 6½x9¾ in.

"Coal in Arizona." by A. C. Rubel. Arizona State Bureau of Mines, Bulletin No. 17, Economic Series No. 6. Unillustrated, 12 pp., 6x9 in.

"Evaporation of Brine from Searles Lake, Calif.," by W. B. Hicks, Department of Interior, U. S. Geological Survey. Illustrated, 8 pp., 9¼x11½ in.

"Loblolly or North Carolina Pine," by W. W. Ashe. North Carolina Geological and Economic Survey, Bulletin No. 24. Illustrated, 169 pp., 7x10 in.

"The Geography of the Fox-Winnebago Valley," by R. H. Whitbeck, Wisconsin Geological and Natural History Survey. Illustrated; 105 pages; 7x10 in.

"Hazards in Handling Gasoline," by George A. Burrell, Dept. of the Interior, Bureau of Mines, Technical Paper 127. Unillustrated; 12 pages; 6x9 in.

"Economic Methods of Utilizing Western Lignite," by E. J. Babcock, Department of the Interior, Bureau of Mines, Bulletin 89. Illustrated, 73 pp., 6x9 in.

"Thirty-Second Annual Report of the Department of Labor of Michigan, 1915," James D. Cunningham, Commissioner of Labor. Unillustrated, 703 pages; 6x9 in.

"The Mineral Production of Pennsylvania for the Year 1913," Report No. 11, Topographic and Geologic Survey of Pennsylvania. Unillustrated; 107 pages; 6x9 in.

"Discovery of Phosphate of Lime in the Rocky Mountains," by Frank D. Adams and W. J. Dick, Commission of Conservation of Canada. Illustrated; 31 pages; 6¾x9¾ in.

"Mineral Production of the United States in 1914, a Summary," by H. D. McCaskey, Dept. of the Interior, U. S. Geological Survey. Unillustrated; 69 pages; 6x9 in.

"A Reconnaissance for Phosphate in the Salt River Range, Wyoming," by G. R. Mansfield, Department of the Interior, U. S. Geological Survey. Illustrated, 19 pp., 6x9 in.

"Fortieth Annual Mine Report" Issued by the Industrial Commission of Ohio, Division of Mines, for the Year Ending Dec. 31, 1914. Unillustrated; 413 pages; 6½x9½ in.

"Description of the Laboratories of the Mines Branch of the Department of Mines, Ottawa, Canada," Dept. of Mines, Mines Branch, Bulletin No. 13. Illustrated, 51 pp., 6½x9¾ in.

"Monthly Statement of Coal Mine Fatalities in the United States, January, 1916," compiled by Albert H. Fay, Department of the Interior, Bureau of Mines. Unillustrated, 13 pp., 6x9 in.

"The Production of Antimony, Arsenic, Bismuth, Selenium and Tellurium in 1914," by Frank L. Hess, Department of the Interior, U. S. Geological Survey. Unillustrated, 30 pp., 6x9 in.

"Investigation of a Reported Discovery of Phosphate in Alberta," by Hugh S. Deschmid, Canada Department of Mines, Mines Branch, Bulletin No. 12. Illustrated, 38 pp., 6½x9¾ in.

"The Carbonizing and Briquetting of Lignite," by S. M. Darling, printed by order of the Legislative Assembly of the Province of Saskatchewan. Illustrated; 47 pages; 7x10 in.

"How a Miner Can Avoid Some Dangerous Diseases," by A. J. Lanza and Joseph H. White. Department of the Interior, Bureau of Mines, Miners' Circular 20. Illustrated, 26 pp., 6x9 in.

"Summary Report of the Mines Branch of the Department of Mines for the Calendar Year Ending Dec. 31, 1914." Printed by order of the Canadian Parliament. Illustrated, 232 pp., 6½x10 in.

"Reports Upon the Ardlethan Tin Field," by J. R. Godfrey, Inspector of Mines, New South Wales Department of Mines, Geological Survey, Mineral Resources No. 20. Illustrated, 77 pp., 6x9½ in.

"Graphite Studies of Ultimate Analyses of Coal," by Oliver C. Ralston, with a preface by Horace C. Porter, Department of the Interior, Bureau of Mines, Technical Paper 93. Illustrated, 41 pp., 6x9 in.

"Some Engineering Problems of the Panama Canal in Their Relation to Geology and Topography," by Donald F. MacDonald. Department of the Interior, Bureau of Mines. Illustrated, 88 pp., 6x9 in.

"Metal Mine Accidents in the United States during the Calendar Year 1914," by Albert H. Fay. Department of the Interior, Bureau of Mines, Technical Paper 129. Illustrated, 96 pp., 6x9 in.

"Quarry Accidents in the United States During the Calendar Year 1914." Compiled by Albert H. Fay, Department of the Interior, Bureau of Mines, Technical Paper 128. Unillustrated, 45 pp., 6x9 in.

"Limits of Inflammability of Mixtures of Methane and Air," by G. A. Burrell and G. G. Oberfell, Dept. of the Interior, Bureau of Mines, Technical Paper 119. Illustrated; 30 pages; 6x9 in.

"Preliminary Report on the Mineral Production of Canada During the Calendar Year 1915." Prepared by John McLeish. Canada Department of Mines, Mines Branch. Unillustrated, 28 pp., 6½x9¾ in.

"Annual Report of the Department of Mines of West Virginia for the Year Ending June 30, 1914," by Earl A. Henry Chief of the Dept. of Mines of West Virginia. Illustrated; 336 pages; 6x9 in.

"Ground Water in La Salle and McMullen Counties, Texas," by Alexander Deussen and R. B. Dole, Department of the Interior, U. S. Geological Survey, Water Supply Paper 375-G. Illustrated, 40 pp., 6x9 in.

"Oil and Gas Maps of Southwestern Pennsylvania." by Richard E. Hice, State Geologist. Topographic and Geologic Survey of Pennsylvania 1915. Illustrated, 22 pp., 6x9 in., with large accompanying maps.

"24th Annual Report of the Ontario Bureau of Mines, The Porcupine Gold Area," by A. G. Burroughs. Printed by order of the Legislative Assembly of Ontario. Illustrated, 73 pp., 6½x9½ in. with insert map.

"The Compressibility of Natural Gas at High Pressure," by G. A. Burrell and I. W. Robertson. Department of the Interior, Bureau of Mines, Technical Paper 131, Petroleum Technology 31. Illustrated, 12 pp., 6x9 in.

"The Production at Cobalt, Molybdenum, Nickel, Tin, Titanium, Tungsten, Radium, Uranium and Vanadium in 1914," by Frank L. Hess, Department of the Interior, U. S. Geological Survey. Unillustrated, 23 pp., 6x9 in.

"Accidents at Metallurgical Works in the United States During the Calendar Years 1913 and 1914." Compiled by Albert H. Fay, Department of the Interior, Bureau of Mines, Technical Paper 124. Unillustrated, 28 pp., 6x9 in.

"Abstract of Current Decisions on Mines and Mining. Reported from May to December, 1915," by J. W. Thompson, Department of the Interior, Bureau of Mines, Bulletin 113, Law Serial 6. Unillustrated, 124 pp., 6x9 in.

"The Production of Cement, Lime, Clay Products, Stone and Other Structural Materials in Canada During the Calendar Year 1914." Canada Department of Mines, Mines Branch. By John McLeish. Unillustrated, 60 pp., 6½x9¾ in.

"Contributions to the PreCambrian Geology of North Michigan and Wisconsin," by R. C. Allen and L. P. Barrett, Michigan Geological and Biological Survey, Publication 18, Geological Series 15. Illustrated, 189 pp., 6x9 in.

"Manufacture of Gasoline and Benzine-Toluene from Petroleum and Other Hydro-Carbons," by W. F. Rittman, C. B. Dutton and E. W. Dean, with a bibliography compiled by M. S. Howard, Department of the Interior, Bureau of Mines, Bulletin 114, Petroleum Technology 29. Illustrated, 268 pp., 6x9 in.

"Mineral Resources of Michigan with Statistical Tables of Production and Value of Mineral Products for 1914 and Prior Years with a Treatise on Michigan Copper Deposits," by R. E. Hore. Prepared under the direction of R. C. Allen, Director of the Michigan Geological and Biological Survey. Publication 19, Geological Series 16. Illustrated, 359 pp., 6x9 in.

TRADE CATALOGS

Hazard Mfg. Co., Wilkes-Barre, Penn. Booklet. Keystone Railroad Signal Wire. Illustrated, 16 pp., 4½x7½ in.

Fairbanks, Morse & Co., Chicago, Ill. Bulletin H178B. "Type Y (Semi-Diesel) Oil Engine." Illustrated, 4 pp., 6x9 in. Bulletin H192C. "Type Y Oil Engines, Style V." Illustrated, 8 pp., 6x9 in.

Allis-Chalmers Mfg. Co., Milwaukee, Wis. Bulletin No. 1632. "Centrifugal Pumps and Centrifugal Pumping Units" Illustrated, 44 pp, 8x10½ in.

The Goulds Mfg. Co., Seneca Falls, N. Y. Bulletin No. 120. "Multi-Stage Centrifugal Pumps." Illustrated, 20 pp., 7½x 10 in.

Myers-Whaley Co., Knoxville, Tenn. Catalog No. 6. "Shoveling Machines." Illustrated, 32 pp., 8½x10 in.

Dodge Sales and Engineering Co., Mishawaka, Ind. Catalog C16. "Power Transmission Machinery." Illustrated, 614 pp., 6x9 in.

INDUSTRIAL NEWS

Chicago, Ill.—The Chicago office of the Platt Iron Works, of Dayton, Ohio, has been removed to 1242 and 1243 Monadnock Block, Chicago. John T. Shay is district manager.

Ralphton, Penn.—It is reported that C. B. Zimmerman, of Somerset has bought from Valentine C. Miller and others a tract of coal land adjacent to the operations of the Quemahoning Coal Co. for something over $50,000.

Chicago, Ill.—The Ball Engine Co. of Erie, Penn., is now being represented in the Chicago district by J. A. Garber. Mr. Garber is located at 1540 Monadnock Block, and is handling the steam shovel interests of the above named company.

Wellsburg, W. Va.—The property of the Wellsburg Coal Co. was offered for sale at public auction at the Brooke County Court House, May 6. The highest bid was $98,700. This was not considered sufficient and the sale was postponed for two weeks.

Scranton, Penn.—The Delaware, Lackawanna & Western Coal Co. recently announced that in future it will offer property owners over coal mines the option of purchasing at reasonable prices the coal pillars under their property as a means of protection against caving.

South Bethlehem, Penn.—With the lighting of 212 ovens of the Lehigh coke plant recently, there are now 424 ovens in operation with a daily capacity of 3,500 tons of coke all of which is purchased by the Bethlehem Steel Co. It is said that the demand for coke is so great that additional furnaces will be built.

Harrisburg, Penn.—The Court recently ruled that the office of mine inspector was a state office and an aspirant thereto need not necessarily reside in the district from which he is a candidate. Consequently, William Reid, though living in Scranton in the 2nd District, may remain a candidate for mine inspector for the 6th district.

Boston, Mass. — The Consolidation Coastwise Co.'s steam collier "Charles F. Mayer," which has been engaged in coal carrying between New England ports and those on Chesapeake Bay, has been sold to a New York concern. The identity of the new owners and the terms of the sale were withheld. The "Mayer" was built in 1883 and has a cargo capacity of 1,600 tons.

Columbus, Ohio—The Ohio Public Utilities Commission has ordered a suspension of 30 days on the rate of $1 from Nelsonville to Toledo on coal shipments, which the Hocking Valley Railway Co., sought to have enforced. The new rate was to become effective May 7. This is the second attempt of the Hocking Valley to increase the rate from 85 cents to $1, the first application having been withdrawn by the railroad company before it was effective.

Louisville, Ky.—Representatives of operators and mine workers' organizations in the western Kentucky field are still conferring on the matter of the wage scale but are no nearer agreement, apparently, than for the last week or more. Meetings are held from day to day at the Seelbach hotel, at which a joint committee, composed of three from each side, generally report failure to make progress. Two years ago negotiations continued until May 20.

Washington, D. C.—The United States Civil Service Commission announces a competitive examination for mineral technologist open to men only. The duties of this position will be a study of the rarer mineral industries as to the occurrence, mining, and preparation or treatment of the rarer minerals or materials containing the rarer metals and earths. Persons who meet the necessary requirements and desire this examination, should at once apply for Form 2118, stating the title of the examination desired, to the United States Civil Service Commission, Washington, D. C.

Braidwood, Ill.—The Murphy-Linskey-Kasher Coal Co. is removing its Braidwood equipment to another shaft which it opened at Pontiac, some three years ago. The cost of mining in this section and the competition of the coals coming from the southern part of the state finally made this operation an unprofitable proposition. The closing down of the Shamrock mine, as it was familiarly known throughout the Wilmington district, is significant because it keeps pace with the rapid decline of the coal mining industry in Northeastern Illinois. Only one shipping mine and one small local development remains in Will County, which some 25 years ago was one of the leading coal producing counties in the entire state.

Market Department

General Review

Announcement of the new anthracite circular starts some activity in hard-coal circles. Bituminous quiet but with an excellent undertone. Heavy shipping in Lake trade. Firm situation in Middle West particularly on the steam grades. Production Expanding.

Anthracite—The final announcement of the increased circular prices has released many orders, fixed a basis on which to negotiate business, and precipitated an increased activity in the trade. The new circular is of too recent date to formulate an opinion as to its effect on the trade, but since the prices had been very accurately anticipated and already discounted in well informed quarters, no unusual developments are expected. It is a distinct relief to have the matter settled, since it has seriously interrupted business as is evidenced by the exceedingly low statement of anthracite shipments for April. Labor difficulties of all kinds both at the mines and in transportation circles, as for instance the seamen's strike, are causing consumers to take protective measures to guard against the possibility of shortages, and stimulating some little buying for this purpose. Shipments to the Lake trade have been as low if not lower than at any time in the modern history of anthracite trade. Incipient labor troubles are interrupting operations slightly, but these are being slowly settled up.

Bituminous—There is a slight stir in the soft coal situation that would seem to indicate that the surplus stock is being cleaned up, and may be the forerunner of an active demand to follow later. Industrial consumption is undoubtedly closely approaching the maximum, while interruptions to transportation are still general due to embargoes and strikes of various sorts. The labor question is also a constant source of trouble to operators; it is steadily becoming more and more evident that there is acute unrest in the ranks of the miners, and this promises to be a potent factor in the future course of the trade. However, the buying power of the market is sufficiently restricted at the moment to discourage any extensive speculation of any kind. The announcement of further restrictions on British fuel exports are noted with interest by American shippers who confidently expect a rapid expansion in our off-shore trade before the close of the current year.

Lake Trade—In spite of the scarcity of vessels and the delayed opening of navigation, coal shipments to the Northwest for the month of April established a new high record. The movement is heavier and the market generally, slightly stiffer, but there are evidences of a distinct undercurrent of dissatisfaction among the operating interests. An analysis of prices shows that they are definitely higher than in the past, but costs are also increased while operators are probably subconsciously affected by reports of extraordinary profits emanating from all industrial lines. The opening of Lake shipping has withdrawn Ohio coals that were being diverted eastward and the market in that direction has been further stiffened by an unexpectedly heavy bunker demand for Dominion coal. The contract demand is especially active on the steam sizes, considerable business having already been concluded at firm prices. In the domestic trade the usual between-seasons conditions prevail with dealers busy cleaning up their stocks.

Middle West—The demand is light, the trade apparently marking time, but prices are firm, production is expanding, and an active business is anticipated when stocking begins. A little temporary activity has been created by unseasonably cool weather. The chief activity at the moment centers on screenings, prices on which are stiff. The Eastern coals are showing a better tone in this market, and the price situation will improve materially if consignment shipments are kept off the market. Arrivals by Lake for the month of April were considerably ahead of those for last year in spite of the indifferent opening. There is much activity in negotiations on contract with prices ranging about 10c. above last year's figures.

A Year Ago—April anthracite makes a new record but the trade is slowing up notably. Heavy loading in foreign trade a feature of the bituminous market. Internal consumption continues low. Light movement in Lake trade.

Business Opinions

Boston News Bureau—War news is so confusing that it is little wonder that there is no equanimity of opinion. Probably we are entering another phase of the war with, perhaps, some signs that we are coming nearer to the end of the struggle, and yet if the German terms are anything as published, peace is a long way off. Unquestionably, however, peace talk will gain rather than lose force from this time out. It will undoubtedly require, nevertheless, some aggressive forward movement and some important victory to induce the opposing forces seriously to consider peace. A state of war with Mexico would hardly affect general sentiment.

Iron Age—The placing of new contracts for upward of 150,000 tons of shell steel in the form of blooms and rounds and negotiations for as much more war steel, including 50,000 tons for Russia and Italy, are the chief developments of the week. Otherwise the steel trade has slowed down, as it has long needed to do. Steel companies which some weeks ago were turning away domestic business for this year seem to have reserved space for renewals of contracts with belligerent countries. Foreign and home consumers in some cases have virtually competed for the available steel, the highest price deciding which should get it. The United States Steel Corporation for the third month in succession reports a new high record in unfilled orders. The total as of Apr. 30 was 9,829,551 tons, an increase of 498,500 tons over the business booked at the end of March, and comparing with other months as follows: February, 8,568,966; January, 7,922,767; December, 7,806,220; November, 7,189,489; April, 1915, 4,162,244.

Dry Goods Economist—Cessation of work from strikes and the rising of cost of production by the granting of higher wages have been important features of the week. In the leading cotton-mill centers in Massachusetts and Rhode Island a raise of 10% has been granted, and similar concessions have been made in other New England centers, more than 100,000 operatives participating. Strikes have occurred in silk mills and in woolen mills at various points. Of great importance, too, are the developments in the coat, suit and skirt industry in New York and vicinity.

Bradstreet—Immense business, extraordinary activity in industry, more demand for money, remarkably good collections, heavy railway traffic and noteworthy strength in prices commingle with and, incidentally, seemingly outweigh such factors as disturbed international relations, evidences of friction in the field of labor, an irregular crop situation, and clear signs of high costs holding up some bulding projects without, however, reducing the total quantity of money expended for construction work. But after all, bank clearings, commercial mortality returns, expenditures for structures, and even strikes, merely point to sustained superabundant activity in trade and industry.

Dun—Various restraining influences, notably the unsettled state of labor, operate to limit business in some directions. Apart from the lines affected, activities are remarkably well sustained considering the extremely high costs, the general scarcity of raw materials and similar handicaps. Many manufacturers are months behind on shipments and endeavor to repress buying rather than encourage it. Commercial failures this week in the United States, are 332 against 336 last week, 333 the preceding week and 429 the corresponding week last year.

Building Permits—Returns received by Dun's Review from 83 leading cities in the United States indicate that permits were granted last month calling for the expenditure of $76,927,860, a gain as compared with the $66,930,612 of the same period last year of 14.9% and of 11.8% over the corresponding month in 1914. The total at New York City shows quite a sharp contraction, that center reporting $14,710,049, as against $16,324,257, a loss of 9.9%.

Marshall Field & Co.—Current wholesale distribution of dry goods shows an increase over the corresponding period of a year ago. The volume of road sales for both immediate and fall delivery is running well ahead of the same week last year. Merchants have visited the market in much larger numbers. Collections are normal. Prices on staple cotton and wool goods are very strong.

ATLANTIC SEABOARD

BOSTON

Pocahontas and New River dull; buyers not yet covered will await developments in marine transportation. Georges Creek in fair supply. Low-priced Pennsylvania grades offering freely. Anthracite prospects good.

Bituminous—The market on Pocahontas and New River continues to be seasonably quiet. Quotations are nominal at $2.85 f.o.b. Hampton Roads and practically all the agencies have surplus coal they would like to move. Coastwise shipments are light, aside from the usual packet steamers that load every week.

Georges Creek is coming forward in comfortable supply and its shippers are among the few today at Philadelphia and New York who can undertake to furnish coal promptly in any quantity. Embargoes are again effective against shipments to this territory all-rail and labor difficulties with seamen are slowing up the movement of steamers and barges. No prices are being made, the output being applied almost exclusively to contract business.

No particular change can be reported in the market for Pennsylvania coals. The higher-priced grades are being placed with no difficulty at maximum prices. Many of the operations are running on only 65 to 75% normal, the scarcity of miners still being the largest single factor. On the low-priced coals the market is extremely quiet. Buying power is enough less here to discourage speculation and practically the only offerings heard now are f.o.b. The Boston & Maine R.R. invited bids on 30,000 tons per month all-rail for June, July, August and September, but whether a purchase was made is not yet known. Another inquiry from the same buyer was for a price alongside Boston for 300,000 tons or so of water coal, but it is unlikely the necessary transportation could be arranged without some difficulty. All-rail movement is much improved, although coal emanating from the N. Y. C. R.R. is still excluded from most points on the N. Y., N. H. & H. R.R.

Anthracite—With the agreement reached at Pottsville, Penn., last week the coal trade is already settling down once more to something like normal. At this writing the new circular is looked for any day, but retail dealers have pretty well discounted anything up to a 30@40c. advance over prices for the corresponding month last season. Some of the anthracite companies announced this week that new prices when made would be effective from May 1; i.e., invoices from that date would be corrected to the new circular. The public is being informed through the newspapers that retail prices will be reduced this week.

The seamen's strike is tieing up tugs and barges in all directions for days at a time and this is seriously affecting receipts at this end.

The rumor that hereafter May 1 rather than Apr. 1 will be the date for "opening prices" is meeting with a ready response from the trade in New England. Storage is not a matter that figures so much in this territory and most dealers would be glad of a breathing spell after the winter months before they are called upon to fill their storage for another year.

Bituminous at wholesale, f.o.b. loading ports at the points designated, is quoted about as follows:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$2.55@3.00	$2.85@3.30	.....	$1.30@1.75
Cambrias and Somersets	2.85@3.20	3.15@3.35	.....	1.60@1.95
Georges Creek (contract)	3.07@3.17	3.37@3.47	$3.00@3.10	$2.00@2.10

Pocahontas and New River are $2.80@2.85, f.o.b. Norfolk and Newport News, Va., and $5.15@5.35 on cars at Providence and Boston.

NEW YORK

Anthracite demand slow. Brisk market expected following announcement of new prices. Bituminous conditions unsatisfactory. Spot market dull and good movement in contract coals. Labor situation serious and operators holding off on contracts.

Anthracite—The anthracite market continues unsettled. Following the announcement of the new schedule of prices dealers look for a brisk demand for a short time, after which it is expected buying will fall off and the market will be dull until fall. Demand has been slow for the past two weeks, as dealers are holding off. Shippers who were not forced to let go, have been holding on in the hope of realizing better prices.

The scarcity of labor at the mines promises to be a big factor next winter and shippers will try and induce dealers to stock up even more than usual during the summer. With most of the embargoes still in force and the marine engineers on strike, water shipments are almost at a standstill in New York Harbor. Shipments to New England water points were considerably delayed.

In New York Harbor the demand is slow. Dealers are not in the market except for immediate needs. Some orders are placed with the understanding that coal is to be billed at existing prices at time of delivery. Various rumors are abroad as to the new price schedule. Some of these called for an increase in the domestic sizes to go into effect on Sept. 1, while other rumors are that there will be an advance with a sliding scale until Sept. 1.

Current quotations, per gross ton, f.o.b. tidewater, at the lower ports, are as follows:

	Circular	Individual		Circular	Individual
Broken	$4.95	.....	Pea	$3.55	$3.55@3.55
Egg	5.05	$5.05@5.05	Buck	2.75	2.75@2.75
Stove	5.30	5.30@5.30	Rice, boiler,		
Nut	5.35	5.35@5.35	barley	2.20	2.20@2.20

Quotations at the upper ports are generally 5c. higher on account of the difference in water freight rates.

Bituminous—Conditions in the soft-coal market are anything but satisfactory. Demand has fallen off and prices are near the bottom mark. Shippers with free coal are having trouble to move it but there is a good movement on contracts. Embargoes are practically unchanged.

Operations in the Somerset and Clearfield districts are being interfered with by labor troubles and similar conditions prevail in western Maryland. Then too, operators are having some trouble with miners who are particular about the work they are asked to do. The scarcity of labor is likely to play an important part in the coal situation for some time to come; even now there are many openings that are unable to produce more than half their quota of coal. Conditions have become such that operators are dubious about entering into more contracts and some of them have turned down good-sized contracts during the past two weeks.

In New York Harbor there are few shippers who are not under embargo. There is an accumulation of coal but shippers are having difficulty in making deliveries on account of the tug-boat strike and towing rates have about tripled within the past two weeks.

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.50@3.60	$3.50@3.60	$3.50@3.60	$1.95@2.05
Georges Creek Tyson	3.10@3.25	3.10@3.25	3.10@3.25	1.60@1.80
Clearfield: Medium	3.00@3.10	3.00@3.10	.....	1.45@1.55
South Forks	3.25@3.50	.....	.....	1.70@1.95
Nanty Glo	3.10@3.20	.....	.....	1.55@1.65
Somerset County: Medium	3.00@3.10	3.00@3.10	3.00@3.10	1.45@1.55
Quemahoning	.....	3.10@3.30	3.10@3.30	1.55@1.75
West Virginia Fairmont	.....	2.80@2.90	2.80@2.90	1.00@1.10
Fairmont mine run	.....	2.70@2.80	2.70@2.80	.90@1.00
Western Maryland	.....	2.80@2.90	2.80@2.90	1.25@1.35

PHILADELPHIA

New anthracite prices announced. Pea coal on sliding scale. Retail price cutters come together. More investigations in sight. Bituminous quiet, with some few new orders. Prices little changed.

Anthracite—With the new prices now out business may be expected to proceed with some vigor, although the amount of coal above ground is such that any real demand cannot be foreseen, except to take advantage of the rising circular from now until September. When the new wage agreement between the workers and operators was ratified at Pottsville it was supposed that the shippers would get back to active business, but such was not to be the case. There seemed to be so much difference of opinion between the operators as to prices that the circular was postponed from day to day. It was announced that all coal shipped during May would be billed at whatever rates were decided upon, but as this was a most unsatisfactory way of selling coal, practically no new business was recorded during the first days of the month. Certainly the public wants to know the cost before buying and under the circumstances the retailers have been helpless. Dealers' yards were filled up tight on May 1 and now they cannot buy coal because it is impossible to sell it.

This would have been an opportune time for a decision by the Dauphin County courts on the question of the new intra-state freight rates ordered by the Public Service Commission to take effect May 1. This might have accelerated the announcement of the new prices and brought the much discussed change of sizes to a climax. For instance, if the pea coal freight rate to Philadelphia is reduced to $1 as ordered by the commission, it is not improbable that the big coal interests would decide to mix, say 40%, of this size with chestnut so as to take the prepared coal rate of $1.30, which has been proposed by the commission to cover the larger sizes.

Another matter which has recently been given consideration is to make the same mine price for coal shipped to all markets. This is a serious question to the anthracite interests, as it would practically mean prohibitive prices to those parts of

the country where soft coal is used for domestic fuel, and anthracite is a luxury on account of the already high cost. Statistics show that the increased anthracite production of the past few years has all been absorbed by the increased population of the big cities where anthracite is used exclusively.

One gratifying feature of the present situation is that the retail dealers are giving every evidence of coming together on the price question. It begins to look now as if the price cutters would practically eliminate themselves by agreeing with all the other dealers to exact a fair profit for their coal. The present stand seems justified, if only because of the increasing labor costs; this is now a serious problem and is likely to grow more so in the next few months.

The newspapers are beginning to take great interest in the question of prices and rumors are that if the retail prices are increased the coal commission will be asked to investigate.

Prices per gross ton f.o.b. cars at mines for line shipments and f.o.b. Port Richmond are as follows:

	Line	Tide		Line	Tide
Broken	$3.60	$5.00	Pea	$2.40	$3.65
Egg	3.70	5.10	Buckwheat	1.80	2.90
Stove	4.00	5.40	Rice	.90	1.80
Chestnut	4.05	5.45	Barley	.55	1.30

These prices with the exception of broken and buckwheat will increase 10c. each month until a maximum of 40c. per ton is reached on Sept. 1. Broken will remain at the same price as quoted.

Bituminous—Consumers are beginning to place orders a little more freely. The demand is not in any great volume for strictly local consumption, but the slight stir seems to indicate that stocks are becoming depleted and buyers forced into the market. Large tonnages are being consumed by the industrial plants and this has been greatly augmented since many of the strikes have been adjusted and the plants making full time again. If it were not for the continued railroad restriction the trade would be busy.

Labor conditions continue to hamper the filling of the orders and reports of short-time operations are general from all operators. Prices hold fairly strong, although in an occasional instance there have been slight reductions. The opinion still holds that as the summer wears on the price of coal will gradually move upward.

Prices per gross ton at mines are about as follows:

Georges Creek Big Vein	$1.90@2.00	Fairmont gas, ¾	$1.50@1.60
South Fork Miller Vein	1.75@1.85	Fairmont gas, mine-run	1.35@1.45
Clearfield (ordinary)	1.40@1.50	Fairmont gas, slack	.95@1.00
Somerset (ordinary)	1.30@1.40	Fairmont lump, ordinary	1.10@1.20
West Va. Freeport	1.20@1.30	Fairmont mine-run	.95@1.05
		Fairmont slack	.90@1.00

BALTIMORE

Yards are well stocked. Labor unrest in some of the bituminous fields cause of uncertainty.

Anthracite—Yards are generally heavily stocked. Most of the dealers had secured as much coal as possible in anticipation of strike troubles, and not much of this has been moved as consumers would not take the fuel at winter rates.

Bituminous—The bituminous trade is unsettled by strike troubles in the Pocahontas, Clearfield and Meyersdale regions though most of the disputes were settled after a few days. Outside of such cases of labor unrest, everything is dull, and most consumers are using surplus stocks. Contract call is light, and purchasing in the open market slow. Prices on better grades remained about the same as for several weeks, however, being quoted to the trade about as follows: Georges Creek Tyson, $1.65; Miller vein, $1.40; Quemahoning, $1.55; Somerset, $1.30; Freeport, $1.10; Fairmont gas, three-quarter, 80 to 85c.; same, run-mine, 80c.; slack, 80c.

HAMPTON ROADS

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

	Week Ending				
Railroad	Apr. 8	Apr. 15	Apr. 22	Apr. 29	May 6
Norfolk & Western	144,562	182,621	140,327	169,430	159,875
Chesapeake & Ohio	90,981	85,973	95,838	94,525	110,108
Virginian	74,198	83,228	59,157	57,675	58,846
Totals	309,741	351,822	295,322	321,630	328,829

Ocean Charters and Freights

COASTWISE FREIGHTS

No developments in rates from Hampton Roads can be reported this week. Bottoms are in short supply, but inquiry is also light, so that quotations are unchanged. $2.25@2.35 is about the range to Boston, with perhaps $1.90 the low charter to points like Providence and New Bedford.

Troubles with seamen continue all along the coast. Transportation lines whether small or large are affected in about the same way. In some cases compromises have been made, but the main issue seems still a long way from settlement.

At New York the end of coal-strike talk is certain to cause a softening in rates to points on Long Island Sound. $1 is still asked, but 75@80c. charters will probably be had within a fortnight.

OCEAN FREIGHTS

Since last report another steamer was chartered in London to load coal at a United States port for a Lower Plate port, at $20.40 with 500 tons per day discharge, and other owners are holding at this figure, although it might be shaded. None of the other export coal charters consummated during the past week have been reported. There has been but little change in freight market conditions, and rates are quotable on about the following basis:

To	Rate	To	Rate
Havana	$4.50@5.00	Bermuda	$5.00@6.00
Cardenas or Sagua	6.25 about	Vera Cruz	6.25 about
Cienfuegos	6.00@6.50	Tampico	6.25 about
Port au Spain, Trinidad	7.25 about	Rio Janeiro	[4]19.00@19.50
St. Lucia	7.25 about	Santos*	[1]19.50@20.00
St. Thomas	6.50@7.00	Montevideo	20.40 about
Barbados	7.25 about	BuenosAires orLa Plata	20.40 about
Kingston	7.00 about	Rosario	20.40@21.60
Curacao	6.75@7.00[3]	West Coast of Italy	31.20@33.60
Santiago	6.50@7.00	Barcelona**	30.00 about
Guantanamo	6.50@7.00	Valparaiso or Callao	17.00 about
Demerara		Marseilles	30.00@32.40

* Consignees paying dockage dues. ** Spanish dues for account of cargo.

[1] 500 tons discharge. [2] 400 tons discharge. [3] And p.c. [4] Net, 1,000 tons discharge. [5] Or other good Spanish port.

W. W. Battie & Co.'s Coal Trade Freight Report.

OCEAN CHARTERS

Coal freight charters have been reported as follows:

NEW YORK

Vessel	Destination	Tons	Rate
Edna	San Domingo	282	$5.50

VIRGINIA

Jethou[2]	Rio	2,781	$19.50[1]
Mendi[4]	W. C. Italy	6,000[3]	
H. Lund[6]	Rio	2,563	19.00[1]
Bohannon	Azores	579	14.00

BALTIMORE

Inverkip	W. C. So. Am.	2,806[5]	
J. A. Hooper	Valparaiso	1,321[5]	

PHILADELPHIA

Vessel	Destination	Tons	Rate
Doris[4]	Italy		
C. Whittemore	Porto Rico	582	
Rebecca M. Walls	Halifax	516	

ATLANTIC RANGE

Port Curtis[4]	River Plate	2,998	

[1] About. [2] Sublet. [3] d.w. [4] May-June. [5] Coke. [6] June.

LAKE MARKETS

PITTSBURGH

Market slightly improved. Lake shipments heavier. Circular price more in evidence.

The Pittsburgh district coal market has gained measurably in strength in the past week, although the situation is still far from being up to expectations. While prices are fairly good as compared with prices in the past, operators find that their costs are much higher, from a variety of causes, and regard present prices as on the whole decidedly unsatisfactory in the circumstances.

Shipments in the Lake trade are gradually increasing, though they are far from heavy thus far. The chief difficulty is in securing Lake transportation, as the vessels are so anxious to move ore that they are generally disposed to make the up trip light, to save time. The boats are moving well, as the April ore shipments down the Lakes amount to 1,658,411 tons, a new record for any April, and May is expected to break all records for that month, with at least 7,000,000 tons, and possibly 8,000,000 tons.

Best Youghiogheny gas coal for spot shipment is held rather firmly at $1.35, though there is occasional shading, while Pan Handle steam coal is fairly firm at $1.25, and the prompt market can be quoted at this range, which is 5c. above last week's quotations. Slack is somewhat firmer despite the increased production due to Lake shipments, but it is not quotable higher than a week ago. We quote prompt coal as follows: Slack, $1@1.10; mine-run, $1.25@1.35; ¾-in., $1.35@1.45; 1¼-in., $1.45@1.55, per net ton at mines, Pittsburgh district.

The circular price of $1.50 on mine-run for the year is being more closely observed, there having been a number of relatively small sales at this figure. On really attractive contracts there is still some disposition to shade.

BUFFALO

Coal moving slowly. Anthracite still uncertain. Bituminous in good supply.

Bituminous—Consumers are fairly well supplied and are not looking for labor difficulties sufficient to restrict ship-

ments. Prices are fairly strong. The coal from Ohio is now going to the Lakes and will not be much of a factor here again till the Lake demand slackens.

The demand from the St. Lawrence Valley is heavier than usual, on account of so much of the Dominion coal being sold for bunker use. This has thrown the Canadian railroads in that territory on the market and Buffalo shippers are looking after it. The down-state trade is only fairly active, as most consumers are well supplied. Some difficulty is experienced in getting coal to New England points and there are still reports of small manufacturing towns in that territory having to shut down for want of coal.

Private contracting appears to have been heavy. Some shippers are holding their contracts to a minimum in expectation that prices will be high in fall and winter, mainly on account of car shortage. At present cars are plentiful but the bituminous miners are uneasy, often refusing to sign the wage scale and failing to work steadily. Many individual strikes occur in the Allegheny Valley. Following is the Pittsburgh schedule and other prices based upon it:

	Pittsburgh	Allegheny Valley	Penn Smokeless
Lump	$2.95	$2.75	$2.80
Three-quarter	2.85	2.60	.....
Mine run	2.75	2.50	2.60
Slack	2.40	2.30	2.60

Prices are per net ton, except east of Rochester and Kingston, Ont., where they are per gross ton.

Anthracite—The movement is decidedly slow. Lake shipments are reduced as never before at this time of the year and the current month will probably show a surprisingly light Lake movement. Consumers are also uncertain about buying and orders are by fits and starts.

The following is the continued winter price at wholesale for anthracite, per gross ton, f.o.b. cars, Buffalo:

Grate	$5.60	Chestnut	$6.10
Egg	5.85	Pea	4.30
Stove	5.85	Buckwheat	3.25

An additional charge of 25c. a gross ton is made for putting coal on vessels.

COLUMBUS

Domestic trade quiet but there is considerable volume of steam business. Lake shipping becoming more active. Much contracting at satisfactory figures.

The trade has been more active, due to increased demand for steam tonnage. Stocks accumulated prior to Apr. 1 are being gradually depleted and buying on the open market is now the rule. In addition there is considerable briskness in contracting, both for railroad fuel and manufacturing plants. The tone of the market is good and future prospects are considered bright.

As it is the between seasons period, there is little doing in domestic trade. Dealers are cleaning up in preparation for the stocking season. Retail stocks are at a low point and orders are being placed only when absolutely necessary; prices are well maintained. Pocahontas is fairly strong.

The Lake trade is growing more active. Boats are very scarce and operators are having a difficult time in chartering bottoms. During the week ending May 5 the Hocking Valley docks at Toledo loaded approximately 144,000 tons for shipment to the Northwest. Lake prices are higher than those of last season.

There is considerable contracting for steam tonnage and prices are about 20c. higher than last year; mine-run is at about $1.20 and three-quarter inch at $1.35 and even more. Some weakness has appeared in the small sizes, especially nut, pea and slack, due to the larger production from the West Virginia fields.

The car question is not as bad as formerly, although a shortage is reported on many of the coal-carrying lines. The fact that the demurrage rules on Lake shipments became effective May 1 is expected to relieve the car situation to a certain extent.

	Hocking	Pomeroy	East Ohio		Hocking	Pomeroy	East Ohio
Re-screened lump	$1.60	$1.70	.....	Egg	$1.30	$1.35	....
Inch and a quarter	1.50	1.50	$1.40	Mine-run	1.20	1.20	$1.15
Three-quarter-inch	1.40	1.40	1.30	Nut, pea and slack	.90	.90	.85
Nut	1.30	1.30	.....	Coarse slack	.80	.80	.75

CINCINNATI

Improving demand though prices are weak in some quarters due to slow movement at the Lake ports. Poor car supply and shortage of labor continue to support the market.

Difficulty in securing sufficient vessels to handle Lake coal has hampered the movement in that direction, resulting in forcing some cheap coal on this market, but all reports agree that the demand is better, both from steam and domestic purchasers. The better supply of screenings resulting from the increasing production of prepared grades for the Lake trade is well taken at fair prices. Retail dealers are also appearing in the market, both of spot coal and on contract; they have been able to pick up some bargains recently, in the shape of coal originally destined for the Lakes. The car situation has improved very little, if at all, the average supply hardly running as high as 60%, and this factor, together with the shortage of labor, is certain to give the market a strong undertone.

DETROIT

Sales of steam coal continue in good volume. Domestic and anthracite arouse little interest. Shipments to Lake Superior large.

Bituminous—In the steam-coal trade, buying continues in gratifying volume. Most of the inquiry centers around fine coal, nut, pea and slack leading at prices around 90c. to $1. There is a moderate demand for three-quarter lump, the price being maintained at about $1.25 and mine-run is about $1.05. Buying of domestic coal is light, though the weather has been cool.

Anthracite—Winter prices are continued on all sizes of anthracite and consumers hesitate to buy at these figures. There is some demand for chestnut and stove is also being taken in small amounts. Conditions on transportation lines in the East hold back delivery.

Lake Trade—Despite the difficulties experienced in working vessels through heavy ice above St. Mary's River, the volume of coal shipments to Lake Superior ports in April, established a new record for the opening month of navigation. The statistical report for the canals shows a total movement of 606,398 tons, of which 100,800 was anthracite and 505,598 was bituminous. This compares with 138,111 tons of anthracite and 149,455 tons of bituminous in April, 1915, and with 39,244 tons of anthracite and 288,576 tons of bituminous in April, 1914. Shippers find it very difficult to get vessel capacity for consignments to Lake Michigan and a rate as high as 60c. has been paid on small cargoes for delivery at Chicago.

LOUISVILLE

Steam coals scarce and high. Movement confined mostly to contracts. Retail stocking purchases begin. Western Kentucky labor situation uncertain.

Kentucky coals are showing most strength in the steam sizes, with nut and slack scarce and some western Kentucky operators crushing mine-run. The bulk of the business is on contracts. Immediate domestic requirements have disappeared, although some stocking orders are being received. Labor conditions in the western Kentucky field are uncertain, depending upon negotiations which have dragged on for weeks with no very clear prospect for an agreement.

Prices per long ton, f.o.b. mines, for eastern Kentucky grades are: Lump, $1.25@2; mine-run, $1@1.25; nut and slack, 75@90c., and in some cases going as high as $1. Western Kentucky lump sells as low as $1 and prices are variable on the steam coals.

COKE

CONNELLSVILLE

Curtailment in output seems to be following recent increase in production with reduction in shipments. Market fairly firm.

Some of the coke operators were surprised at the H. C. Frick Coke Co.'s announcement of a new wage scale, with an advance averaging close to 8%, to go into effect Monday, May 8. While the Steel Corporation had announced late in April that there would be a general advance in its wages May 1 it was thought in some quarters the advance would not extend to the coke region. There has been such a good supply of labor that there has been more or less overproduction in the past few weeks, as compared with consumptive demand, resulting in a decline in prices to a level which operators regard as quite out of line with the high prices of pig iron and steel products generally.

The spot furnace coke market has been a shade firmer in the past week, with $2.25 as the minimum for any standard brands, and some quoted up to $2.40 or $2.50. Efforts were started some time ago to represent to operators the desirability of not drawing coke on Thursday and it seems there has now been some curtailment in consequence, with hopes entertained that there will in future be enough curtailment to prevent any coke being dumped on the market.

Foundry coke has yielded to the lower prices ruling in the past few weeks on furnace coke, and some good brands are now available at $3.50, though two or three operators are still quoting the $3.75 price that represented the market until

very lately. There is no interest in either furnace or foundry coke on contract. We quote: Prompt furnace, $2.25@2.40; contract, $2.50@3; prompt foundry, $3.50@3.75; contract, $3.50, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Apr. 29 at 446,220 tons, an increase of 38,920 tons, and shipments at 409,262 tons, a decrease of 43,410 tons.

Buffalo—The recovery of strength is not as rapid as was expected. There is a good degree of activity, but shippers do not quote prices any higher than formerly. It appears that prices were too high, as compared with coal and they may not go materially higher till coal advances. The coke regions are increasing the pay of the miners, as though the profits were still good. Quotations remain on the basis of $5.25 for best 72-hr. Connellsville foundry, $4.45 for 48-hr. furnace, $3.85 for high sulphur and $3.60 for stock.

Chicago—The demand for all grades of coke is rampant, although no price changes have occurred. Sales seem to increase more readily than production expands. Phices per net ton, f.o.b. cars Chicago, are as follows: Connellsville, $6.50; Wise County, $6.25 to $6.50; Byproduct Foundry, $6.25 to $6.50; Byproduct Domestic, $4.50; Gas House, $4.50 to $4.60.

MIDDLE WESTERN

GENERAL REVIEW

Trading light but conditions satisfactory. Screenings soaring to top-notch prices. Some evidences of domestic buying for stocking purposes.

Trade conditions are generally satisfactory despite continued light demand during the week. Signs here and there indicate that production is broadening out, and with the near approach of the stocking season it is anticipated that a revival in domestic buying will occur. Increased tonnage has been hoisted at Indiana and Illinois mines, owing to the appearance of orders from the retail trade, and many domestic orders have been booked for future delivery.

Prices are being maintained at firm levels. Small steam sizes continue in the greatest demand. Spot screenings are stiff in price, with the coarser steam sizes well taken for current shipment, owing to storage piles becoming exhausted. Northwestern market conditions are steady without any noticeable features. Notwithstanding the demand for Eastern coals is quiet, smokeless grades show a better tone. Overshipments are not so much in evidence so that there are less price concessions, and if Eastern consignment coal is kept off Western markets the price situation for these grades should materially improve.

More or less discussion has occurred regarding future prices for anthracite. Interests here representing Eastern shippers have been informed that they should continue to sell anthracite to retailers at the full winter circular. As a result the anthracite market is very quiet, and it will be some time before storage movement begins. Lake movement during April, which commenced inauspiciously, was heavier this year than in April of last year. Signing of contracts still continues with avidity, mostly for steam sizes, prices averaging about 10c. above last season.

CHICAGO

Chicago market quiet except the demand for steam coals which is brisk at high prices. Domestic shipments practically nothing and eastern coals still spotty.

Williamson County coal is moving comparatively well with the exception of 6-in. lump. Fine coal is moving freely at from 95c. to $1.05, with the coarse sizes piling up at the mines unsold. The same conditions prevail at the Franklin County mines to a lesser degree, operations there averaging about three days a week. In order to satisfy the demand some operators are making 3-in. screenings, which have been sold at the maximum figure. Saline County domestic sizes are weak, while fine coal is moved as fast as it is screened.

Springfield grades are moving at about the same ratio as Southern Illinois coals, the mines averaging two to three days per week. Mine-run is in fair demand at $1.15, and some domestic lump has been shipped on coarse steam orders.

In the Indiana market some ordering by retailers has occurred owing to cold and damp weather. The steam trade is very satisfactory with an increased demand from industrial centers. Clinton and Knox County screenings are readily sold as high as $1.10.

Some inferior grades of mine-run smokeless have sold down as low as $1.10 per ton while the better grades have brought around $1.35. The market has not been oversupplied due to the better demand in the East. Numerous concessions have been made to move lump and egg below the circular price of $1.70. Little splint lump is moving at $1.40.

Kentucky quotations show the usual wide range, with little activity indicated in this market.

No buying has occurred in the anthracite market except a few orders placed by retailers to satisfy the demands of householders.

Quotations in the Chicago market are as follows, per net ton f.o.b. cars at mines:

	Williamson and Franklin Co.	Springfield	Carterville	Clinton	Knox and Greene Cos.
Lump	$1.35@1.45	$1.35@1.40	$1.35@1.45	$1.40@1.50	$1.50
Steam lump	....	1.25@1.35	1.25	1.30@1.35	1.35@1.40
2½ and 3-in. lump	....	....	....	....	1.35
1¼-in. lump	....	....	....	....	1.25
Egg	1.35@1.45	1.25@1 35	1.35@1.45	1.40@1.50	1.25
Nut	1.35@1.45	1.25@1.35	....	1.40@1.50	....
No.1washed	1.45@1.50	....	1.35@1 50	....	....
No.2washed	1.35@1.40	....	.90@1.00	....	....
No. 1 nut	1.45	....	....	....	....
No. 2 nut	1.35	....	....	....	....
Mine-run	1 25	1.15	1 25	1.10@1.15	1.10@1 15
Screenings	1.00@1.10	.95@1.00	1.00@1.05	.95@1.05	.95@1 00

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.35@1.50	$1.25@2.00	$1.35@1.60	$1.25@1.60	$1.70@1.75
1¼-in. lump	1.45@1.50	....	....	....	1.40@1.50
Egg	1.30	1.25@1.90	1.35@1.60	1.25@1.60	1.60@1.70
Nut	1.35	1.15@1.60	1.35@1.45	1.25@1.45	....
No. 1 nut	1.35@1.45	....	....	....	....
No. 2 nut	1.35	....	....	....	....
Mine-run	1.25	1.20@1.25	1.15@1.25	1.10@1 25	1 25
Screenings	1 00@1.10	.95@1.00	....	....	....

KANSAS CITY

Owing to the strikes in the Kansas district, the prices are now very firm. There is still a constant cry for mill and slack, with prices at $1.65 and $1.75. Domestic coal has had no demand for some time, and the shortage of steam coal is of course becoming more and more serious. Car shortage, especially on the Missouri Pacific, is having its effect on the market, also, although as yet there is nothing of grave importance.

PRODUCTION AND TRANSPORTATION STATISTICS

ANTHRACITE SHIPMENTS

The shipments of anthracite for April, 1916, as reported to the Anthracite Bureau of Information at Wilkes-Barre, show a sharp decline as compared with the preceding month of this year and with April, 1915. The quantity shipped last month amounted to 4,528,784 tons, a decrease of 1,598,567 tons, or 26 per cent. as compared with March, when the shipments were 6,127,351 tons. Compared with April, 1915, when the shipments were 6,655,625 tons, the record for last month shows a decrease of 2,126,841 tons, or 31 per cent. The April shipments for 1916 were the smallest for that month in any April since 1901, with the two exceptions of 1906 and 1912, when there were suspensions pending the renewal of the wage agreements. Uncertainty as to prices which might obtain after the establishment of a new wage agreement to take the place of the one which expired Mar. 31, is assigned as the principal cause of the reduced production.

Anthracite shipments for April and the first four months of 1915-16 were as follows:

	April		4 Months	
	1916	1915	1916	1915
Phila. & Reading	854,005	1,121,959	4,272,430	3,597,874
Lehigh Valley	797,400	1,365,119	3,814,742	4,038,489
Cent. R.R. of N. J	465,095	779,356	2,269,114	2,439,902
Del. Lack. & West	561,301	977,948	3,324,668	2,828,664
Del. & Hudson	575,786	642,913	2,302,523	2,428,790
Pennsylvania	381,505	647,395	2,108,590	2,014,992
Erie	572,843	737,548	2,681,251	2,443,688
Ont. & Western	150,543	215,963	664,417	688,842
Lehigh & New Eng	*170,306	169,424	799,056	433,191
	4,528,784	6,655,625	22,236,791	20,914,432

*Exclusive of 62,398 tons delivered to the C. R. R. of N. J. at Hauto.

NORFOLK AND WESTERN

Destination of shipments over this road for March and the first three months of last year and this year were as follows, in short tons:

	March		Three Months	
Coal	1915	1916	1915	1916
Tidewater, foreign	190,818	247,353	387,443	673,168
Tidewater, coastwise	310,353	320,028	835,922	971,496
Domestic	1,403,581	2,191,146	4,189,346	6,391,985
Coke				
Tidewater, foreign	327	5,400	1,837	15,226
Domestic	70,797	188,352	208,087	508,929
Total	1,975,876	2,952,279	5,622,635	8,560,804

Financial Department

Delaware & Hudson Co.

This company reports, in part, for the year ended Dec. 31, 1915 as follows:

PRODUCTION, REVENUES AND EXPENSES

Year	Coal Mined	*Revenues	†Expenses	Net Revenues
1915	8,100,767 tons	$15,860,676.65	$14,616,705.70	$1,243,970.95
1914	7,400,695 tons	15,517,041.94	14,553,052.94	963,989.00
Increase	700,072 tons	$343,634.71	$63,652.76	$279,981.95

* Excluding dividends received from stock of coal companies owned.
† Excluding taxes.

INCOME ACCOUNT, YEARS ENDED DEC. 31

Coal Mining Dept.:	1915	1914	Increase (+), or decrease (—)
Gross revenues	$15,860,676.65	$15,517,041.94	+$343,634.71
Gross expenses	14,616,705.70	14,553,052.94	+63,652.76
Net revenues	$1,243,970.95	$963,989.00	+279,981.95
Taxes accrued	467,932.98	323,102.21	+144,830.77
Operating income	$776,037.97	$640,886.79	+135,151.18
Other Income:			
Dividends and interest	704,762.42	717,068.64	—12,306.22
Gross income, Coal Department.	$1,480,800.39	$1,357,955.43	+$122,844.96

Dividends—A dividend was declared on Dec. 29, 1915, to be paid out of the accumulated surplus, upon the outstanding $42,503,000 of capital stock, at the rate of 9%, amounting in the aggregate to $3,825,270, payable during 1916, as follows:

Two and one-quarter per cent. to stockholders of record on Feb. 26, 1916, payable on Mar. 20, 1916;

Two and one-quarter per cent. to stockholders of record on May 27, 1916, payable on June 20, 1916;

Two and one-quarter per cent. to stockholders of record on Aug. 28, 1916, payable on Sept. 20, 1916;

Two and one-quarter per cent. to stockholders of record on Nov. 27, 1916, payable on Dec. 20, 1916.

Three separate strikes during the year caused temporary idleness at one or more collieries, the total loss being equivalent to closing one colliery for 62 hr. or 6 8-9 working days. This compares with 4 6-9 days lost in 1914. The idle time in both years would have been avoided had the employees continued to work and permitted the differences to be adjusted in the orderly manner provided by agreement.

The Supreme Court of Pennsylvania, which has final jurisdiction of the question, has held unconstitutional the state tax of two and one-half per cent. of the value of anthracite when prepared for market, imposed on and after June 28, 1913, the validity of which was in litigation when the report for last year was submitted. The question directly decided was as to the validity of the Rooney Act, which was superseded on June 1, 1915, by the Dawson Act, of similar tenor and effect. Although the constitutionality of the latter was not directly in issue, the same objection, that the tax applied to one kind of coal produced in the state, anthracite, and not to another kind, bituminous coal, applies equally to the Dawson Act, which is plainly, therefore, equally unconstitutional.

Several mining machines, for cutting coal in thin veins, where ordinary methods of mining make the cost practically prohibitive, were installed. Although similar machines have long been used in the bituminous coal fields, and more than one-half of their current output is the product of machine mining, it is only within the last four years that machinery capable of satisfactory results in anthracite mining has been developed.

The workmen's compensation Act of Pennsylvania, which became effective on Jan. 1, 1916, provides compensation at fixed rates for mining employees injured in the performance of their duties and, in cases of fatal accidents, for the dependents of those killed. This company is complying with the Act, which, it is estimated, will add not less than $350,000 to the annual expenses of your coal Department. This is practically an increase in wages, as the occupational hazards have affected all negotiations and arrangements by which rates of wages have been determined.

The agreement with employees, which took effect on Apr. 1 1912, will terminate on Mar. 31, 1916, and ten demands, as to future wages and terms of employment, have been presented by mine employees.

Estimates show that acquiescence in the demand for an increase of 20% in wages rates would alone add about $23,000,000 to the cost of producing the annual output of Pennsylvania anthracite. This sum could not be taken from profits, for, according to the data for 1909 compiled by the United States Bureau of the Census, the whole difference between the annual value of the output ($148,957,894) and the cost of production ($134,245,600, not including in the latter any allowance for depletion of supply or any return upon the investment, was $14,712,294. Moreover, if this $14,712,294 be diminished by an allowance of 5c. per ton of coal produced for the depletion of the supply in the ground (72,215.273 tons at 5c. = $3,610,764), there is left only $11,101,530 as the highest possible return to $246,713,318 of capital which the Bureau of the Census states as the amount of the investment in anthracite producing property. This would be a return at the rate of approximately 4½% per annum.

General Remarks—The conditions of the year 1915 have no parallel in history. The unprecedented conflict of arms that absorbed the energies of so large a portion of the world has made this country, at least temporarily, a source of supply for capital and commodities to which other peoples, especially the belligerents, have eagerly resorted. Purchases of commodities for export upon a large scale and at ascending prices have given stimulus not only to the industries directly affected but indirectly to many others.

BALANCE SHEET DEC. 31

Assets	1915	1914	Liabilities	1915	1914
Unmined coal owned and controlled	$14,272,695	$14,667,663	Capital stock	$42,503,000	$42,503,000
Advances on unmined coal	268,653	301,827	Bonds	76,278,625	62,320,000
Real estate	2,406,984	785,575	Loans payable	2,703,534	3,018,534
Road and equip.—			Int., divs., etc., accured	1,584,205	1,401,971
D. & H. Co.	68,317,762	68,995,852	Interest, divs. and bonds due, not yet collected	218,826	222,261
Canadian lines	6,464,030	6,464,030	Accrued taxes	151,330	135,066
Marine equipment	4,286	4,936	Spec. reserve fund accts.	10,743	10,408
Coal dept. equip.	1,342,319	1,356,144	Audited vouchers and pay rolls	2,791,008	2,799,549
Coal handling storage plants	72,099	68,066	Other accounts payable	722,685	476,610
Stocks and bonds	a28,544,318	28,102,890	Additions to property prior to June 30, 1907 through inc.	6,839,487	6,839,487
Cash	2,504,949	1,968,246	Profit and loss	20,711,152	18,773,318
Fire insurance fund	543,542	472,740			
Spec. reserve funds	10,743	10,408			
Equip. trust fund	2,654,231	1,909,061			
Special deposits	b14,349,001	1,055,378			
Supplies on hand	1,937,160	2,717,942			
Bills and accts. rec.	5,011,339	4,534,927			
Adv., new lines	5,810,485	5,084,519			
Total	$154,514,595	$138,500,204	Total	154,514,595	138,500,204

a The total par value of stocks owned in 1915 was $27,371,774, against $27,327,074 in 1914 (value as per balance sheet) in 1915, $23,419,521; par value of bonds, $5,350,716 in 1915 (value as per balance sheet).

b Includes $862,093 unexpected balance from proceeds of bonds deposited with trustee to defray cost of authorized additions and betterments and $13,476,350 proceeds from sale of 5% 20-year convertible gold bonds.

Note—For previous annual report of the company, see Vol. 6, p. 410.

Island Creek Coal Co.—The earnings of this company for the past two years compare as follows:

Cal. Year	Net Earns.	Net Profits	Other Income	Pref. Divs.	Com. Divs.	Reserve Fund	Balance, Sur. or def.
1915	$907,022	$818,871	.....	$299,124	$236,977	$128,619	sr. $154,151
1914	1,008,387	938,908	$4,245	298,872	562,711	119,672	def. 38,102

Consolidation Coal Co., Md.—The New York Stock Exchange has admitted to list $8,000,000 capital stock, on official notice of issuance, $7,980,000 in exchange for 2-year 7% convertible debenture bonds and $20,000 payment in full, making the total amount authorized to be listed $39,190,500.

Marmet Coal Co.—The report of receivers Charles W. Poysell and Edward Marmet, of the Marmet Coal Co., showing the operation of the company for the period between July 1, 1915, and Feb. 29, 1916, indicated a loss of $14,204.70 for that period. October was the only month of the period in which operations were not at a loss. The total liabilities of the company are fixed at $474,933.48.